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L.N. 150 of 2020

ELECTRONIC COMMUNICATIONS (REGULATION) ACT (CAP. 399)

General Authorisations (Radiocommunications Apparatus) (Amendment) Regulations, 2020

IN EXERCISE of the powers conferred by articles 34 and 47 of the Electronic Communications (Regulation) Act, the Minister responsible for communications after consultation with the Malta Communications Authority, has made the following regulations:-

Citation.

1. The title of these regulations is the General Authorisations (Radiocommunications Apparatus) (Amendment) Regulations, 2020, and they shall be read and construed as one with the General Authorisations (Radiocommunications Apparatus) Regulations, hereinafter referred to as "the principal regulations".

S.L. 399.40.

Amends the Arrangement of Regulations and the Twenty-Sixth Schedule to the principal regulations.

2. In the Arrangement of Regulations and in the Twenty-Sixth Schedule to the principal regulations, for the words "Road Transport and Traffic Telematics systems (RTTT)", wherever they occur, shall be substituted by the words "Transport and Traffic Telematics systems".

Amends regulation 2 of the principal regulations.

3. Regulation 2 of the principal regulations shall be amended as follows:

(a) the definition "on non-interference and non-protection basis" shall be substituted by the following:

" "on non-interference and non-protection basis" means that no harmful interference may be caused to any other radiocommunication service and that no claim may be made for protection of radiocommunications apparatus to which a general authorisation under these regulations applies against interference origination from radiocommunication services;"; and

(b) immediately after the definition "ship" there shall be added the following:

" "short-range device" or "SRD" means radiocommunications apparatus which provides either unidirectional or bidirectional communication and which receives and, or transmits over a short distance at low power;".

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4. The Annex to the Second Schedule to the principal regulations shall be substituted by the following:

Amends the Second Schedule to the principal regulations.

"ANNEX
(Paragraph 3 of the Second Schedule)

Minimum Technical Parameters of Wideband Data Transmission Systems

Frequency band	Transmit power limit/ power density limit	Additional parameters	Other usage restrictions
863-868 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: > 600 kHz and ≤ 1 MHz Duty cycle: ≤ 10% for network access points Duty cycle: ≤ 2.8% otherwise	This set of usage conditions is only available for wideband short range devices (SRD) in data networks.
917.4-919.4 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: ≤ 1 MHz Duty cycle: ≤ 10% for network access points Duty cycle: ≤ 2.8% in other cases	This set of usage conditions is only available for wide band short-range devices (SRD) in data networks. All devices within the data network shall be under the control of network access points.
2400-2483.5 MHz	100 mW e.i.r.p. and 100 mW/100 kHz e.i.r.p. density applies when frequency hopping modulation is used. 10 mW/MHz e.i.r.p. density applies when other types of modulation are used	Requirements on techniques to access spectrum and mitigate interference apply[1].	
5150-5250 MHz	200 mW mean e.i.r.p. 10 mW/MHz e.i.r.p. density in any 1 MHz band.		Indoor use only.

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5250-5350 MHz	200 mW mean e.i.r.p. 10 mW/MHz e.i.r.p. density in any 1 MHz band.	Transmitter power control (TPC) shall be employed to provide, on average, a mitigation factor of at least 3 dB on the maximum permitted transmit power of the system. If TPC is not in use, the maximum permitted transmit power and maximum permitted power density limits shall be reduced by 3 dB. Systems shall use mitigation techniques that give at least the same protection as the detection, operational and response requirements described in EN 301 893 to ensure compatible operation with radiodetermination systems. Such mitigation techniques shall equalise the probability of selecting a specific channel for all available channels so as to ensure, on average, a near-uniform spread of the spectrum loading.	Indoor use only.
5470-5725 MHz	1 W mean e.i.r.p. 50 mW/MHz e.i.r.p. density in any 1 MHz band.		
57-71 GHz	40 dBm e.i.r.p. and 23 dBm/MHz e.i.r.p. density	Requirements on techniques to access spectrum and mitigate interference apply[1].	Fixed outdoor installations are excluded.

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57-71 GHz	40 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and maximum transmit power of 27 dBm at the antenna port or ports	Requirements on techniques to access spectrum and mitigate interference apply[1].	
57-71 GHz	55 dBm e.i.r.p., 38 dBm/MHz e.i.r.p. density and a transmit antenna gain ≥ 30 dBi	Requirements on techniques to access spectrum and mitigate interference apply[1].	This set of usage conditions is only available to fixed outdoor installations.
[1] 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. If 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 under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.			

".

5. The Annex to the Fourth Schedule to the principal regulations shall be substituted by the following:

Amends the Fourth Schedule to the principal regulations.

"**ANNEX**
(Paragraph 3 of the Fourth Schedule)

Minimum Technical Parameters of Non-Specific Short-Range Devices

Frequency band	**Transmit power limit/ field strength limit/power density limit**	**Additional parameters**	**Other usage parameters**	**Frequency band reference (informative)**
442.2-450.0 kHz	7 dBµA/m at 10m	Channel spacing: ≥ 150 Hz	This set of usage conditions is only available for person detection and collision avoidance devices.	85
456.9-457.1 kHz	7 dBµA/m at 10m		This set of usage conditions is only available for emergency detections of buried victims and valuable items devices.	18
13553-13567 kHz	10 mW e.r.p.			27c

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26957-27283 kHz	10 mW e.r.p.			28
26990-27000 kHz	100 mW e.r.p.	Duty cycle limit: 0.1%	Model control devices may operate without duty cycle restrictions.	29
27040-27050 kHz	100 mW e.r.p.	Duty cycle limit: 0.1%	Model control devices may operate without duty cycle restrictions.	30
27090-27100 kHz	100 mW e.r.p.	Duty cycle limit: 0.1%	Model control devices may operate without duty cycle restrictions.	31
27140-27150 kHz	100 mW e.r.p.	Duty cycle limit: 0.1%	Model control devices may operate without duty cycle restrictions.	32
27190-27200 kHz	100 mW e.r.p.	Duty cycle limit: 0.1%	Model control devices may operate without duty cycle restrictions.	33
40.66-40.7 MHz	10 mW e.r.p.			35
138.2-138.45 MHz	10 mW e.r.p.	Duty cycle limit: ≤ 1%		e
169.4-169.475 MHz	500 mW e.r.p.	Channel spacing (maximum): 50 kHz Duty cycle limit: 1.0%		37c
169.4-169.4875 MHz	10 mW e.r.p.	Duty cycle limit: 0.1%		38
169.4875-169.5875 MHz	10 mW e.r.p.	Duty cycle limit: 0.001%	Between 00:00h and 06:00h local time a duty cycle limit of 0.1% may be used.	39b
169.5875-169.8125 MHz	10 mW e.r.p.	Duty cycle limit: 0.1%		40

433.05-434.79 MHz	1 mW e.r.p. and -13 dBm/10 kHz power density for bandwidth modulation larger than 250 kHz		Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	44a
433.05-434.79 MHz	10 mW e.r.p.	Duty cycle limit: 10%		44b
434.04-434.79 MHz	10 mW e.r.p.	Duty cycle limit: 100% subject to channel spacing up to 25 kHz	Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	45c
862-863 MHz	25 mW e.r.p.	Duty cycle limit: 0.1% Bandwidth: ≤ 350 kHz		87
863-865 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 0.1% may also be used.		46a
865-868 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 1% may also be used.		47

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865-868 MHz	500 mW e.r.p. Adaptive Power Control (APC) required. Alternatively other mitigation techniques with at least an equivalent level of spectrum compatibility.	Transmissions only permitted within the frequency ranges 865.6-865.8 MHz, 866.2-866.4 MHz, 866.8-867.0 MHz and 867.4-867.6 MHz. Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10% for network access points Duty cycle: ≤ 2.5% otherwise	This set of usage conditions is only available for data networks.	47b
868-868.6 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 1% may also be used.		48
868.7-869.2 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 0.1% may also be used.		50

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869.4-869.65 MHz	500 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 10% may also be used.		54
869.7-870 MHz	5 mW e.r.p.		Voice applications are allowed with advanced mitigation techniques. Other audio and video applications are excluded.	56a
869.7-870 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Alternatively a duty cycle limit of 1% may also be used.		56b
874-874.4 MHz	500 mW e.r.p. Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least an equivalent level of spectrum compatibility.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10% for network access points Duty cycle: 2.5% in other cases	This set of usage conditions is only available for data networks. All devices within the data network shall be under the control of network access points.	1

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917.3-918.9 MHz	500 mW e.r.p. Transmissions only permitted within the frequency ranges 917.3-917.7 MHz, 918.5-918.9 MHz Adaptive Power Control (APC) required, alternatively other mitigation techniques which achieve at least an equivalent level of spectrum compatibility.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: ≤ 200 kHz Duty cycle: ≤ 10% for network access points Duty cycle: ≤ 2.5% in other cases	This set of usage conditions is only available for data networks. All devices within the data network shall be under the control of network access points.	4
917.4-919.4 MHz	25 mW e.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1]. Bandwidth: ≤ 600 kHz Duty cycle: ≤ 1%	This set of usage conditions is only available for short-range devices in data networks. All devices within the data network shall be under the control of network access points.	5
2400-2483.5 MHz	10 mW equivalent isotropic radiated power (e.i.r.p.)			57a
5725-5875 MHz	25 mW e.i.r.p.			61
24.15-24.25 GHz	100 mW e.i.r.p.			70a
57-64 GHz	100 mW e.i.r.p. and a maximum transmit power of 10 dBm			74a
61-61.5 GHz	100 mW e.i.r.p.			76
122-122.25 GHz	10 dBm e.i.r.p/ 250 MHz and -48 dBm/MHz at 30° elevation			80a
122.25-123 GHz	100 mW e.i.r.p.			80b

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244-246 GHz	100 mW e.i.r.p.			81
[1] 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. If 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 under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.".				

6. The Annex to the Fifth Schedule to the principal regulations shall be amended as follows:

Amends the Fifth Schedule of the principal regulations.

(a) in the table thereof the words "119-128 kHz" shall be substituted by the words "119-128.6 kHz";

(b) in the table thereof, the row for the frequency band "13553-13567 kHz" shall be substituted by the following:

"

13553-13567 kHz	42 dBµA/m at 10 meters	Transmission mask and antenna requirements for all combined frequency segments apply[1, 2].	

";

(c) immediately after the table thereof, there shall be added the following:

"[1] Antenna requirements that provide an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant restrictions are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these restrictions shall be ensured.

[2] Transmission mask that provides an appropriate level of performance to comply with the essential requirements of Directive 2014/53/EU shall be used. If relevant restrictions are described in harmonised standards or parts thereof the references of which have been published in the Official Journal of the European Union under Directive 2014/53/EU, performance at least equivalent to these restrictions shall be ensured."; and

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(d) in the table thereof, the row for the frequency band "26957-27283 kHz" shall be deleted.

Substitutes the Eleventh Schedule to the principal regulations.

7. The Eleventh Schedule to the principal regulations shall be substituted by the following:

"**ELEVENTH SCHEDULE**
(Regulation 3)
General Authorisation for Apparatus using ultra-wideband technology

Applicability of the Eleventh Schedule.

1. This Schedule applies to any person installing or using radiocommunications apparatus using ultra-wideband technology or any apparatus intended to be used as a component part of that apparatus.

Interpretation.

2. In this Schedule unless the context otherwise requires:

"apparatus using ultra-wideband technology" or "UWB" means apparatus incorporating, as an integral part or as an accessory, technology for short-range radiocommunication, involving the intentional generation and transmission of radio-frequency energy that spreads over a frequency range wider than 50 MHz, which may overlap several frequency bands allocated to radiocommunication services;

"contact based UWB material sensing devices" means UWB material sensing apparatus for which the UWB transmitter is only switched on when in direct contact with the material under investigation;

"Directive 2007/46/EC" means Directive 2007/46/EC of the European Parliament and of the Council of 5 September 2007 establishing a framework for the approval of motor vehicles and their trailers, and of systems, components and separate technical units intended for such vehicles;

"indoors" means inside buildings or places in which the shielding will typically provide the necessary attenuation to protect radiocommunication services against harmful interference;

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"LT1" means systems intended for general location tracking of people and objects that can be put into service on an unlicensed basis;

"maximum mean power spectral density" means the average power per unit bandwidth (centred on that frequency) radiated in the direction of the maximum level under the specified conditions of measurement and which is specified as e.i.r.p. of the radio device under test at a particular frequency;

"motor vehicle" has the same meaning as set out in Article 3(11) of Directive 2007/46/EC;

"non-contact based UWB material sensing devices" means UWB material sensing apparatus for which the UWB transmitter is only switched on when it is near the investigated material and the UWB transmitter is directed towards the material under investigation (for example manually by using a proximity sensor or by mechanical design);

"on-board aircraft" means the use of radio links for communications purposes inside an aircraft;

"peak power" means the power contained within a 50 MHz bandwidth at the frequency at which the highest mean radiated power occurs, radiated in the direction of the maximum level under the specified conditions of measurement and which is specified as e.i.r.p.;

"railway vehicle" has the same meaning as set out in Article 3(1)(4) of Regulation (EU) 2018/643;

"Regulation (EU) 2018/643" means Regulation (EU) 2018/643 of the European Parliament and of the Council of 18 April 2018 on rail transport statistics; and

"total power spectral density" means the average of the mean power spectral density values measured over a sphere around the measurement scenario with a resolution of at least 15 degrees.

Minimum technical parameters.

3. Apparatus using ultra-wideband technology shall meet the conditions set out in the Annex to this Schedule.

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Limitations.

4. (a) Apparatus using ultra-wideband technology meeting the conditions specified in this Schedule shall be used indoors or, if it is used outdoors, it is not attached to a fixed installation, a fixed infrastructure or a fixed outdoor antenna.

(b) Apparatus using ultra-wideband technology meeting the conditions specified in this Schedule shall also be allowed in motor and railway vehicles.

ANNEX TO THE ELEVENTH SCHEDULE
(Paragraph 3 of the Eleventh Schedule)

Minimum Technical Parameters of Apparatus using Ultra-Wideband Technology

1. GENERIC ULTRA-WIDEBAND (UWB) USAGE

Technical requirements		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
f ≤ 1.6 GHz	-90 dBm/MHz	-50 dBm
1.6 < f ≤ 2.7 GHz	-85 dBm/MHz	-45 dBm
2.7 < f ≤ 3.1 GHz	-70 dBm/MHz	-36 dBm
3.1 < f ≤ 3.4 GHz	-70 dBm/MHz or -41.3 dBm/MHz using LDC[1]or DAA[2]	-36 dBm or 0 dBm
3.4 < f ≤ 3.8 GHz	-80 dBm/MHz or -41.3 dBm/MHz using LDC[1] or DAA[2]	-40 dBm or 0 dBm
3.8 < f ≤ 4.8 GHz	-70 dBm/MHz or -41.3 dBm/MHz using LDC[1] or DAA[2]	-30 dBm or 0 dBm
4.8 < f ≤ 6 GHz	-70 dBm/MHz	-30 dBm
6 < f ≤ 8.5 GHz	-41.3 dBm/MHz	0 dBm
8.5 < f ≤ 9 GHz	-65 dBm/MHz or -41.3 dBm/MHz using DAA[2]	-25 dBm or 0 dBm
9 < f ≤ 10.6 GHz	-65 dBm/MHz	-25 dBm
f > 10.6 GHz	-85 dBm/MHz	-45 dBm

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(1) Within the 3.1 GHz to 4.8 GHz band. The Low Duty Cycle ('LDC') mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule.

(2) Within the 3.1 GHz to 4.8 GHz and 8.5 GHz to 9 GHz bands. The Detect and Avoid ('DAA') mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule.

2. LOCATION TRACKING SYSTEMS Type 1 (LT1)

Technical requirements		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
f ≤ 1.6 GHz	-90 dBm/MHz	-50 dBm
1.6 < f ≤ 2.7 GHz	-85 dBm/MHz	-45 dBm
2.7 < f ≤ 3.4 GHz	-70 dBm/MHz	-36 dBm
3.4 < f ≤ 3.8 GHz	-80 dBm/MHz	-40 dBm
3.8 < f ≤ 6.0 GHz	-70 dBm/MHz	-30 dBm
6 < f ≤ 8.5 GHz	-41.3 dBm/MHz	0 dBm
8.5 < f ≤ 9 GHz	-65 dBm/MHz or -41.3 dBm/MHz using DAA[1]	-25 dBm or 0 dBm
9 < f ≤ 10.6 GHz	-65 dBm/MHz	-25 dBm
f > 10.6 GHz	-85 dBm/MHz	-45 dBm

(1) The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-2 V2.1.1. 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 respect the conditions specified in this Schedule.

3. UWB DEVICES INSTALLED IN MOTOR AND RAILWAY VEHICLES

Technical requirements		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
f ≤ 1.6 GHz	-90 dBm/MHz	-50 dBm
1.6 < f ≤ 2.7 GHz	-85 dBm/MHz	-45 dBm
2.7 < f ≤ 3.1 GHz	-70 dBm/MHz	-36 dBm
3.1 < f ≤ 3.4 GHz	-70 dBm/MHz or -41.3 dBm/MHz using LDC[1] + e.l.[4] or -41.3 dBm/MHz using TPC[3]+ DAA[2] + e.l.[4]	-36 dBm or ≤0 dBm or ≤0 dBm

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3.4 < f ≤ 3.8 GHz	-80 dBm/MHz or -41.3 dBm/MHz using LDC[1] + e.l.[4] or -41.3 dBm/MHz using TPC[3]+DAA[2] + e.l.[4]	-40 dBm or ≤0 dBm or ≤0 dBm
3.8 < f ≤ 4.8 GHz	-70 dBm/MHz or -41.3 dBm/MHz using LDC[1] + e.l.[4] or -41.3 dBm/MHz using TPC[3]+DAA[2] + e.l.[4]	-30 dBm or ≤0 dBm or ≤0 dBm
4.8 < f ≤ 6 GHz	-70 dBm/MHz	-30 dBm
6 < f ≤ 8.5 GHz	-53.3 dBm/MHz or -41.3 dBm/MHz using LDC[1] + e.l.[4] or -41.3 dBm/MHz using TPC[3]+e.l.[4]	-13.3 dBm or ≤0 dBm or ≤0 dBm
8.5 < f ≤ 9 GHz	-65 dBm/MHz or -41.3 dBm/MHz using TPC[3]+DAA[2] + e.l.[4]	-25 dBm or ≤0 dBm
9 < f ≤ 10.6 GHz	-65 dBm/MHz	-25 dBm
f > 10.6 GHz	-85 dBm/MHz	-45 dBm

(1) The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-3 V2.1.1. 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 respect the conditions specified in this Schedule.

(2) The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-3 V2.1.1. 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 respect the conditions specified in this Schedule.

(3) The Transmit Power Control ('TPC') mitigation technique and its limits are defined in clauses 4.7.1.1, 4.7.1.2 and 4.7.1.3 of ETSI Standard EN 302 065-3 V2.1.1. 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 respect the conditions specified in this Schedule.

(4) The exterior limit (e.l.) ≤ -53.3 dBm/MHz is required. The exterior limit is defined in clauses 4.3.4.1, 4.3.4.2 and 4.3.4.3 of ETSI Standard EN 302 065-3 V2.1.1. 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 respect the conditions specified in this Schedule.

Technical requirements to be used within the bands 3.8-4.2 GHz and 6-8.5 GHz for vehicular access systems using trigger-before-transmit are defined in the following table:

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Technical requirements		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
3.8 < f ≤ 4.2 GHz	-41.3 dBm/MHz with trigger-before-transmit operation and LDC ≤ 0.5% (in 1hour)	0 dBm
6 < f ≤ 8.5 GHz	-41.3 dBm/MHz with trigger-before-transmit operation and LDC ≤ 0.5% (in 1hour) or TPC	0 dBm

'Trigger-before-transmit' mitigation is defined as a UWB transmission that is only initiated when necessary, specifically where the system indicates that UWB devices are nearby. The communication is either triggered by a user or by the vehicle. The subsequent communication can be considered as 'triggered communication'. The existing LDC mitigation applies (or alternatively TPC in the 6 GHz to 8.5 GHz range). An exterior limit requirement must not be applied when using the trigger-before-transmit mitigation technique for vehicular access systems.

Trigger-before-transmit mitigation techniques that provide an appropriate level of performance in order to comply with the essential requirements of Directive 2014/53/EU shall be used for vehicular access systems. If 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 under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured. These techniques shall respect the conditions specified in this Schedule.

4. UWB ONBOARD AIRCRAFT

The values for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r..p.) for short-range devices using UWB technology, with or without use of mitigation techniques are listed in the table below:

Technical requirements			
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**	**Requirements for mitigation techniques**
f ≤ 1.6 GHz	-90 dBm/MHz	-50 dBm	
1.6 < f ≤ 2.7 GHz	-85 dBm/MHz	-45 dBm	
2.7 < f ≤ 3.4 GHz	-70 dBm/MHz	-36 dBm	

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3.4 < f ≤ 3.8 GHz	-80 dBm/MHz	-40 dBm	
3.8 < f ≤ 6.0 GHz	-70 dBm/MHz	-30 dBm	
6.0 < f ≤ 6.650 GHz	-41.3 dBm/MHz	0 dBm	
6.650 < f ≤ 6.6752 GHz	-62.3 dBm/MHz	-21 dBm	notch of 21 dB should be implemented to meet the -62.3 dBm/ MHz[1] level
6.6752 < f ≤ 8.5 GHz	-41.3 dBm/MHz	0 dBm	7.25 to 7.75 GHz (FSS and MetSat (7.45 to 7.55 GHz) protection)[1, 2] 7.75 to 7.9 GHz (MetSat protection)[1,3]
8.5 < f ≤ 10.6 GHz	-65 dBm/MHz	-25 dBm	
f > 10.6 GHz	-85 dBm/MHz	-45 dBm	

(1) Alternative mitigation techniques, such as the use of shielded portholes, may be used if they ensure at least an equivalent performance.

(2) 7.25 to 7.75 GHz (Fixed Satellite Service) and 7.45 to 7.55 GHz (Meteorological Satellite) protection:
$-51.3 - 20*\log_{10}(10[km]/x[km])$(dBm/MHz) for heights above ground of over 1000 m, where x is the aircraft height above ground in kilometres, -71.3 dBm/MHz for heights above ground of 1000 m and below.

(3) 7.75 to 7.9 GHz (Meteorological Satellite) protection:
$-44.3 - 20*\log_{10}(10\ [km]/x\ [km])$ (dBm/MHz) for heights above ground of over 1000 m, where x is the aircraft height above ground in kilometres, and -64.3 dBm/MHz for heights above ground of 1000 m and below.

5. MATERIAL SENSING DEVICES USING UWB TECHNOLOGY

Material sensing devices based on UWB technology shall comply either with the generic UWB conditions set out in section 1 of this Schedule or with the specific limits for material sensing devices set out in sections 5.1 and 5.2 hereof.

The generic UWB conditions set out in section 1 of this Schedule excludes fixed outdoor installations. Emissions radiated by a material sensing device must not exceed the limits of the regulation for generic UWB usage specified in section 1. Material sensing devices must fulfil the requirements of mitigation techniques specified for the generic use of UWB in section 1.

The specific limits for material sensing devices including the mitigation techniques are listed in the following tables. Emissions radiating from material sensing devices permitted under this Schedule must be kept to a minimum and in any case not exceed the emission limits within the following tables. Compliance with the specific limits must be ensured by the device placed on a representative structure of the investigated material. The specific limits listed in the following tables are applicable in all environments for material sensing devices, except those to which

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note 5 of these tables, which excludes fixed outdoor installation in certain applicable frequency ranges, applies.

5.1 Contact based material sensing devices

The specific limits for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r.p.) for contact based material sensing devices using UWB technology are defined in the table below.

Technical requirements for contact based UWB material sensing devices		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
f ≤ 1.73 GHz	-85 dBm/MHz (see note 1)	-45 dBm
1.73 < f ≤ 2.2 GHz	-65 dBm/MHz	-25 dBm
2.2 < f ≤ 2.5 GHz	-50 dBm/MHz	-10 dBm
2.5 < f ≤ 2.69 GHz	-65 dBm/MHz (see notes 1 and 2)	-25 dBm
2.69< f ≤ 2.7 GHz (see note 4)	-55 dBm/MHz (see note 3)	-15 dBm
2.7 < f ≤ 2.9 GHz	-70 dBm/MHz (see note 1)	-30 dBm
2.9 < f ≤ 3.4 GHz	-70 dBm/MHz (see note 1, 6 and 7)	-30 dBm
3.4 < f ≤ 3.8 GHz (see note 4)	-50 dBm/MHz (see notes 2,6 and 7)	-10 dBm
3.8 < f ≤ 4.8 GHz	-50 dBm/MHz (see notes 6 and 7)	-10 dBm
4.8 < f ≤ 5.0 GHz (see note 4)	-55 dBm/MHz (see notes 2 and 3)	-15 dBm
5.0 < f ≤ 5.25 GHz	-50 dBm/MHz	-10 dBm
5.25<f ≤ 5.35 GHz	-50 dBm/MHz	-10 dBm
5.35<f ≤ 5.6 GHz	-50 dBm/MHz	-10 dBm
5.6<f ≤ 5.65 GHz	-50 dBm/MHz	-10 dBm
5.65<f≤5.725 GHz	-50 dBm/MHz	-10 dBm
5.725<f≤6.0 GHz	-50 dBm/MHz	-10 dBm
6.0<f≤8.5 GHz	-41.3 dBm/MHz (see note 5)	0 dBm
8.5<f≤9.0 GHz	-65 dBm/MHz (see note 7)	-25 dBm
9.0<f≤10.6 GHz	-65 dBm/MHz	-25 dBm
f > 10.6 GHz	-85 dBm/MHz	-45 dBm

Verżjoni Elettronika

(1) Devices using the Listen Before Talk ('LBT') mechanism are permitted to operate in the 1.215 GHz to 1.73 GHz frequency range with a maximum mean e.i.r.p. spectral density of -70 dBm/MHz and in the 2.5 GHz to 2.69 GHz and 2.7 GHz to 3.4 GHz frequency ranges with a maximum mean e.i.r.p. spectral density of -50 dBm/MHz and a maximum peak e.i.r.p. of -10 dBm/50 MHz. The LBT mechanism is defined in clauses 4.5.2.1, 4.5.2.2 and 4.5.2.3 of ETSI Standard EN 302 065-4 V1.1.1. 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 respect the conditions specified in this Schedule.

(2) To protect the radio services, non-fixed installations must fulfil the following requirement for total radiated power:

(a) In the 2.5 GHz to 2.69 GHz and 4.8 GHz to 5 GHz frequency ranges, the total power spectral density must be 10 dB below the maximum e.i.r.p. spectral density.

(b) In the 3.4 GHz to 3.8 GHz frequency range, the total power spectral density must be 5 dB below the maximum e.i.r.p. spectral density.

(3) To protect the Radio Astronomy Service (RAS) in the 2.69 GHz to 2.7 GHz and 4.8 GHz to 5 GHz bands, the total power spectral density must be below -65 dBm/MHz.

(4) Limitation of the Duty Cycle to 10% per second.

(5) No fixed outdoor installation is permitted.

(6) Within the 3.1 GHz - 4.8 GHz band, devices implementing LDC mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule. When LDC is implemented, note 5 applies.

(7) Within the 3.1 GHz - 4.8 GHz and 8.5 GHz - 9 GHz bands, devices implementing DAA mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule. When DAA is implemented, note 5 applies.

5.2 Non-contact based material sensing devices

The specific limits for maximum mean power spectral density (e.i.r.p.) and maximum peak power (e.i.r.p.) for non-contact based material sensing devices using UWB technology are defined in the table below.

Technical requirements for non-contact based UWB material sensing devices		
Frequency range	**Maximum mean power spectral density (e.i.r.p.)**	**Maximum peak power (e.i.r.p.) (defined in 50 MHz)**
f ≤ 1.73 GHz	-85 dBm/MHz (see note 1)	-60 dBm
1.73 < f ≤ 2.2 GHz	-70 dBm/MHz	-45 dBm
2.2 < f ≤ 2.5 GHz	-50 dBm/MHz	-25 dBm
2.5 < f ≤ 2.69 GHz	-65 dBm/MHz (see notes 1 and 2)	-40 dBm
2.69< f ≤ 2.7 GHz (see note 4)	-70 dBm/MHz (see note 3)	-45 dBm

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2.7 < f ≤ 2.9 GHz	-70 dBm/MHz (see note 1)	-45 dBm
2.9 < f ≤ 3.4 GHz	-70 dBm/MHz (see note 1, 6 and 7)	-45 dBm
3.4 < f ≤ 3.8 GHz (see note 4)	-70 dBm/MHz (see notes 2,6 and 7)	-45 dBm
3.8 < f ≤ 4.8 GHz	-50 dBm/MHz (see notes 6 and 7)	-25 dBm
4.8 < f ≤ 5.0 GHz (see note 4)	-55 dBm/MHz (see notes 2 and 3)	-30 dBm
5.0 < f ≤ 5.25 GHz	-55 dBm/MHz	-30 dBm
5.25<f ≤ 5.35 GHz	-50 dBm/MHz	-25 dBm
5.35<f ≤ 5.6 GHz	-50 dBm/MHz	-25 dBm
5.6<f ≤ 5.65 GHz	-50 dBm/MHz	-25 dBm
5.65<f≤5.725 GHz	-65 dBm/MHz	-40 dBm
5.725<f≤6.0 GHz	-60 dBm/MHz	-35 dBm
6.0<f≤8.5 GHz	-41.3 dBm/MHz (see note 5)	0 dBm
8.5<f≤9.0 GHz	-65 dBm/MHz (see note 7)	-25 dBm
9.0<f≤10.6 GHz	-65 dBm/MHz	-25 dBm
f > 10.6 GHz	-85 dBm/MHz	-45 dBm

Verżjoni Elettronika

(1) Devices using the LBT mechanism are permitted to operate in the 1.215 GHz to 1.73 GHz frequency range with a maximum mean e.i.r.p. spectral density of -70 dBm/MHz and in the 2.5 GHz to 2.69 GHz and 2.7 GHz to 3.4 GHz frequency ranges with a maximum mean e.i.r.p. spectral density of -50 dBm/MHz and a maximum peak e.i.r.p of -10 dBm/50 MHz. The LBT mechanism is defined in clauses 4.5.2.1, 4.5.2.2 and 4.5.2.3 of ETSI Standard EN 302 065-4 V1.1.1. 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 respect the conditions specified in this Schedule.

(2) To protect the radio services, non-fixed installations must fulfil the following requirement for total radiated power:

(a) In the 2.5 GHz to 2.69 GHz and 4.8 GHz to 5 GHz frequency ranges, the total power spectral density must be 10 dB below the maximum e.i.r.p. spectral density.

(b) In the 3.4 GHz to 3.8 GHz frequency range, the total power spectral density must be 5 dB below the maximum e.i.r.p. spectral density.

(3) To protect the Radio Astronomy Service (RAS) in the 2.69 GHz to 2.7 GHz and 4.8 GHz to 5 GHz bands, the total power spectral density must be below -65 dBm/MHz.

(4) Limitation of the Duty Cycle to 10% per second.

(5) No fixed outdoor installation is permitted.

(6) Within the 3.1 GHz to 4.8 GHz band, devices implementing LDC mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The LDC mitigation technique and its limits are defined in clauses 4.5.3.1, 4.5.3.2 and 4.5.3.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule. When LDC is implemented, note 5 applies.

(7) Within the 3.1 GHz to 4.8 GHz and 8.5 GHz to 9 GHz bands, devices implementing DAA mitigation technique are permitted to operate with a maximum mean e.i.r.p. spectral density of -41.3 dBm/MHz and a maximum peak e.i.r.p. of 0 dBm defined in 50 MHz. The DAA mitigation technique and its limits are defined in clauses 4.5.1.1, 4.5.1.2 and 4.5.1.3 of ETSI Standard EN 302 065-1 V2.1.1. 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 respect the conditions specified in this Schedule. When DAA is implemented, note 5 applies.

Peak power threshold values for the LBT mechanism to ensure the protection of radio services listed below are defined in the following table.

Technical requirements of the LBT mechanism for material sensing devices		
Frequency range	**Radio service to be detected**	**Peak power threshold value**
1.215 <f ≤1.4 GHz	Radiodetermination service	+8 dBm/MHz
1.61<f ≤ 1.66 GHz	Mobile satellite service	-43 dBm/MHz
2.5 < f ≤ 2.69 GHz	Land mobile service	-50 dBm/MHz
2.9 < f ≤ 3.4 GHz	Radiodetermination service	-7dBm/MHz

Additional requirements for radar detection: continuously listening and automatic switch-off within 10 ms for the related frequency range if the threshold value is exceeded (table with LBT mechanism). A silent time of at least 12 s while listening continuously is necessary before the transmitter can be switched on again. This silent time during which only the LBT receiver is active must be ensured even after the device is switched off.".

Verżjoni Elettronika

8. In the Annex to the Twelfth Schedule to the principal regulations, the row for the frequency band "865-868 MHz" shall be substituted by the following: Amends the Twelfth Schedule to the principal regulations.

"

865-868 MHz	2 W e.r.p. Interrogator transmissions at 2 W e.r.p. are only permitted within the four channels centred at 865.7 MHz, 866.3 MHz, 866.9 MHz and 867.5 MHz each with a maximum bandwidth of 200 kHz. RFID interrogator devices placed on the market before 1 January 2018 are "grandfathered", i.e. they are continuously permitted to use in line with the provisions set out in EC Decision 2006/804/EC before 1 January 2018.	Techniques to access spectrum and mitigate interference that provide at least equivalent performance to the techniques described in harmonised standards adopted under Directive 2014/53/EU must be used.	

".

9. In the Annex to the Thirteenth Schedule to the principal regulations, immediately after the row for the frequency band "169.4-169.475 MHz" there shall be added the following: Amends the Thirteenth Schedule to the principal regulations.

"

430-440 MHz	-50 dBm/100kHz e.r.p. power density but not exceeding a total power of -40 dBm/10MHz (both limits are intended for measurement outside of the patient's body)		The set of usage conditions is only available for Ultra-Low Power Wireless Medical Capsule Endoscopy (ULP-WMCE) applications.

".

Verżjoni Elettronika

Amends the Nineteenth Schedule to the principal regulations.

10. The Annex to the Nineteenth Schedule to the principal regulations shall be amended as follows:

(a) in the table thereof, the row for the frequency band "315-600 kHz" shall be deleted; and

(b) in the table thereof, the row for the frequency band "12500-20000 kHz" shall be deleted.

Amends the Twenty-Sixth Schedule to the principal regulations.

11. The Twenty-Sixth Schedule to the principal regulations shall be amended as follows:

(a) paragraph 2 thereof, shall be substituted by the following:

"2. In this Schedule:

"Commission Implementing Regulation 2016/799" means Commission Implementing Regulation (EU) 2016/799 of 18 March 2016 implementing Regulation (EU) No 165/2014 of the European Parliament and of the Council laying down the requirements for the construction, testing, installation, operation and repair of tachographs and their components;

"Directive 2015/719" means Directive (EU) 2015/719 of the European Parliament and of the Council of 29 April 2015 amending Council Directive 96/53/EC laying down for certain road vehicles circulating within the Community the maximum authorised dimensions in national and international traffic and the maximum authorised weights in international traffic;

"smart tachograph, weight and dimension applications" are defined as remote enforcement of the tachograph in Appendix 14 of Commission Implementing Regulation 2016/799 and for the weights and dimensions enforcement in Article 10d of Directive 2015/719; and

"transport and traffic telematics systems" means apparatus that are used in the fields of transport (road, rail, water or air, depending on the relevant technical restrictions), traffic management, navigation, mobility management and in intelligent transport systems.";

Verżjoni Elettronika

(b) the Annex to the Twenty-Sixth Schedule to the principal regulations shall be substituted by the following:

"ANNEX
(Paragraph 3 of the Twenty-Sixth Schedule)

Minimum Technical Parameters of Road Transport and Traffic Telematics

Frequency band	Transmit power limit/ power density limit	Additional parameters	Other usage parameters
5795-5815 MHz	2 W e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1].	This set of usage conditions applies only to road tolling applications and smart tachograph, weight and dimension applications.
5855-5865 MHz	33 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and a Transmit Power Control (TPC) range of 30 dB.	Requirements on techniques to access spectrum and mitigate interference apply[1].	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.
5865-5875 MHz	33 dBm e.i.r.p., 23 dBm/MHz e.i.r.p. density and a Transmit Power Control (TPC) range of 30 dB.	Requirements on techniques to access spectrum and mitigate interference apply[1].	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.
24.05-24.075 GHz	100 mW e.i.r.p.		
24.075-24.15 GHz	100 mW e.i.r.p.	Requirements on techniques to access spectrum and mitigate interference apply[1].	This set of usage conditions is only available to ground-based vehicle radars.
24.075-24.15 GHz	0.1 mW e.i.r.p.		
24.15-24.25 GHz	100 mW e.i.r.p.		

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63.72-65.88 GHz	40 dBm e.i.r.p.	Road transport telematics systems placed on the market before 1 January 2020 are 'grandfathered', i.e. they are permitted to use the previous frequency range 63-64 GHz, and otherwise the same conditions apply.	This set of usage conditions is only available to vehicle-to-vehicle, vehicle-to-infrastructure and infrastructure-to-vehicle systems.
76-77 GHz	55 dBm peak e.i.r.p. and 50 dBm mean e.i.r.p. and 23.5 dBm mean e.i.r.p. for pulse radars	Requirements on techniques to access spectrum and mitigate interference apply[1]. Fixed transportation infrastructure radars have to be of a scanning nature in order to limit the illumination time and ensure a minimum silent time to achieve coexistence with automotive radar systems.	This set of usage conditions is only available to ground-based vehicle and infrastructure systems.
76-77 GHz	30 dBm peak e.i.r.p. and 3 dBm/MHz average power spectral density	Duty cycle limit: ≤56%/s	This set of usage conditions is only available to obstacle detection systems for rotorcraft use.

[1] 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. If 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 under Directive 2014/53/EU, performance at least equivalent to these techniques shall be ensured.".

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