

RO-IR UWB-02-1

TECHNICAL REGULATION

for the radio interface

concerning equipment using ultra-wideband (UWB) technology

(material sensing devices)

98/34/EC Notification number: 2015/139/RO

1. Basic considerations

The Radio Equipment and Telecommunications Terminal Equipment Directive 1999/5/EC (R&TTE Directive) was implemented in Romania (RO) by Government Decision No. 130/2015.

This technical regulation contains the necessary equipment parameters for the licence exempt use of equipment using ultra-wideband (UWB) technology (material sensing devices) in the specified frequency bands and considers especially compliance with Articles 3.2, 4.1, 6 and 7.2 of Directive 1999/5/EC.

Nothing in this Technical Regulation shall preclude the need for equipment placed on the market in Romania to comply with Directive 1999/5/EC.

The obligations arising from Directive 98/34/EC of the European Parliament and of the Council of 22 June 1998 laying down a procedure for the provision of information in the field of technical standards and regulations and of rules on Information Society services (OJ L 204 p. 37), as amended by Directive 98/48/EC of the European Parliament and of the Council of 20 July 1998 (OJ L 217 p. 18), have been hereby met.

All Romanian Technical Regulations notified under Directive 1998/34/EC will be published and will be made available free of charge from the ANCOM web-site at:

<http://www.ancom.org.ro/en/interface-regulations- 2723>

2. Radio Interface Specifications

UWB material sensing devices

Frequency range
Below 1.73 GHz
1.73 to 2.2 GHz
2.2 to 2.5 GHz
2.5 to 2.69 GHz
2.69 to 2.7 GHz
2.7 to 2.9 GHz
2.9 to 3.4 GHz
3.4 to 3.8 GHz
3.8 to 4.8 GHz
4.8 to 5 GHz
5 to 5.25 GHz
5.25 to 5.35 GHz
5.35 to 5.6 GHz
5.6 to 5.65 GHz
5.65 to 5.725 GHz
5.725 to 8.5 GHz
8.5 to 10.6 GHz
Above 10.6 GHz

For the purpose of this Technical Regulation, *equipment using ultra-wideband (UWB) technology* means equipment incorporating, as an integral part or as an accessory, technology for short-range radio communication, 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 radio communication services.

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

Peak power, specified as e.i.r.p., is 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.

Total radiated 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 degree. The detailed measuring setup is contained within ETSI EN 302 435.

Material sensing devices permitted under this technical regulation shall fulfil the following requirements:

Fixed installation (application A)

- the transmitter has to switch off if the machine is not running, "running sensor";
- the transmitter shall implement a TPC with a dynamic range of 10 dB, as described in the harmonised standard EN 302 498-2 for ODC (*Object Discrimination and Characterisation*) applications;
- the transmitter shall be attached to a fixed installation.

Non-fixed installation (application B)

- transmitter-on only if manually operated with a non-locking switch (e.g. it may be a sensor for the presence of the operators hand) plus being in contact or close proximity to the investigated material and the emissions being directed into the direction of the object (e.g. measured by a proximity sensor or imposed by the mechanical design);
- the transmitter has to switch off if the machine is not running, "running sensor".

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 devices against harmful interference originating from radio communications services.

The use of radio spectrum by equipment using ultra-wideband technology (UWB) is allowed on a non-interference and non-protected basis provided that such equipment meets the conditions set out in the Annex and it is used indoors or, if it is used outdoors, it is not attached to a fixed installation, a fixed infrastructure or a fixed outdoor antenna.

ROMANIA	Radio Interface Specification	SRD / UWB applications	RO-IR UWB-02-1	Edition 1/ 2015
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	Nr	Parameter	Description	Comments																																																																														
Normative part	1	Radio communication Service	Mobile																																																																															
	2	Application	Short Range Devices / UWB applications	Material sensing devices																																																																														
	3	Frequency band	See row (7) below for applicable frequency bands	Harmonised radio spectrum for ultra-wideband technology (Decision 2014/702/EU amending Decision 2007/131/EC)																																																																														
	4	Channelling	-																																																																															
	5	Modulation / Occupied bandwidth	-																																																																															
	6	Direction / Separation	-																																																																															
	7	Transmit power / Power density	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range</th> <th colspan="2">Fixed installations (Application A)</th> <th rowspan="2">Non-fixed installations (Application B) Maximum mean power spectral density (e.i.r.p)</th> </tr> <tr> <th>Maximum mean power spectral density (e.i.r.p)</th> <th>Maximum mean power spectral density (e.i.r.p) in the horizontal plane (- 20° to 30° elevation)</th> </tr> </thead> <tbody> <tr> <td>Below 1.73 GHz</td> <td colspan="2">- 85 dBm/MHz</td> <td>- 85 dBm/MHz</td> </tr> <tr> <td>1.73 to 2.2 GHz</td> <td>- 65 dBm/MHz</td> <td>- 70 dBm/MHz</td> <td>- 70 dBm/MHz</td> </tr> <tr> <td>2.2 to 2.5 GHz</td> <td colspan="2">- 50 dBm/MHz</td> <td>- 50 dBm/MHz</td> </tr> <tr> <td>2.5 to 2.69 GHz</td> <td>- 65 dBm/MHz ⁽¹⁾</td> <td>- 70 dBm/MHz</td> <td>- 65 dBm/MHz ⁽¹⁾ ⁽²⁾</td> </tr> <tr> <td>2.69 to 2.7 GHz</td> <td>- 55 dBm/MHz</td> <td>- 75 dBm/MHz</td> <td>- 70 dBm/MHz ⁽³⁾</td> </tr> <tr> <td>2.7 to 2.9 GHz</td> <td>- 50 dBm/MHz</td> <td>- 70 dBm/MHz</td> <td>- 70 dBm/MHz</td> </tr> <tr> <td>2.9 to 3.4 GHz</td> <td>- 50 dBm/MHz</td> <td>- 70 dBm/MHz</td> <td>- 70 dBm/MHz ⁽¹⁾</td> </tr> <tr> <td>3.4 to 3.8 GHz</td> <td>- 50 dBm/MHz</td> <td>- 70 dBm/MHz</td> <td>- 50 dBm/MHz ⁽²⁾ ⁽³⁾</td> </tr> <tr> <td>3.8 to 4.8 GHz</td> <td colspan="2">- 50 dBm/MHz</td> <td>- 50 dBm/MHz</td> </tr> <tr> <td>4.8 to 5 GHz</td> <td>- 55 dBm/MHz</td> <td>- 75 dBm/MHz</td> <td>- 55 dBm/MHz ⁽²⁾ ⁽³⁾</td> </tr> <tr> <td>5 to 5.25 GHz</td> <td colspan="2">- 50 dBm/MHz</td> <td>- 50 dBm/MHz</td> </tr> <tr> <td>5.25 to 5.35 GHz</td> <td>- 50 dBm/MHz</td> <td>- 60 dBm/MHz</td> <td>- 60 dBm/MHz</td> </tr> <tr> <td>5.35 to 5.6 GHz</td> <td colspan="2">- 50 dBm/MHz</td> <td>- 50 dBm/MHz</td> </tr> <tr> <td>5.6 to 5.65 GHz</td> <td>- 50 dBm/MHz</td> <td>- 65 dBm/MHz</td> <td>- 65 dBm/MHz</td> </tr> <tr> <td>5.65 to 5.725 GHz</td> <td>- 50 dBm/MHz</td> <td>- 60 dBm/MHz</td> <td>- 60 dBm/MHz</td> </tr> <tr> <td>5.725 to 8.5 GHz</td> <td colspan="2">- 50 dBm/MHz</td> <td>- 50 dBm/MHz</td> </tr> <tr> <td>8.5 to 10.6 GHz</td> <td colspan="2">- 65 dBm/MHz</td> <td>- 65 dBm/MHz</td> </tr> <tr> <td>Above 10.6 GHz</td> <td colspan="2">- 85 dBm/MHz</td> <td>- 85 dBm/MHz</td> </tr> </tbody> </table>	Frequency range	Fixed installations (Application A)		Non-fixed installations (Application B) Maximum mean power spectral density (e.i.r.p)	Maximum mean power spectral density (e.i.r.p)	Maximum mean power spectral density (e.i.r.p) in the horizontal plane (- 20° to 30° elevation)	Below 1.73 GHz	- 85 dBm/MHz		- 85 dBm/MHz	1.73 to 2.2 GHz	- 65 dBm/MHz	- 70 dBm/MHz	- 70 dBm/MHz	2.2 to 2.5 GHz	- 50 dBm/MHz		- 50 dBm/MHz	2.5 to 2.69 GHz	- 65 dBm/MHz ⁽¹⁾	- 70 dBm/MHz	- 65 dBm/MHz ⁽¹⁾ ⁽²⁾	2.69 to 2.7 GHz	- 55 dBm/MHz	- 75 dBm/MHz	- 70 dBm/MHz ⁽³⁾	2.7 to 2.9 GHz	- 50 dBm/MHz	- 70 dBm/MHz	- 70 dBm/MHz	2.9 to 3.4 GHz	- 50 dBm/MHz	- 70 dBm/MHz	- 70 dBm/MHz ⁽¹⁾	3.4 to 3.8 GHz	- 50 dBm/MHz	- 70 dBm/MHz	- 50 dBm/MHz ⁽²⁾ ⁽³⁾	3.8 to 4.8 GHz	- 50 dBm/MHz		- 50 dBm/MHz	4.8 to 5 GHz	- 55 dBm/MHz	- 75 dBm/MHz	- 55 dBm/MHz ⁽²⁾ ⁽³⁾	5 to 5.25 GHz	- 50 dBm/MHz		- 50 dBm/MHz	5.25 to 5.35 GHz	- 50 dBm/MHz	- 60 dBm/MHz	- 60 dBm/MHz	5.35 to 5.6 GHz	- 50 dBm/MHz		- 50 dBm/MHz	5.6 to 5.65 GHz	- 50 dBm/MHz	- 65 dBm/MHz	- 65 dBm/MHz	5.65 to 5.725 GHz	- 50 dBm/MHz	- 60 dBm/MHz	- 60 dBm/MHz	5.725 to 8.5 GHz	- 50 dBm/MHz		- 50 dBm/MHz	8.5 to 10.6 GHz	- 65 dBm/MHz		- 65 dBm/MHz	Above 10.6 GHz	- 85 dBm/MHz		- 85 dBm/MHz	
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	8	Channel access and occupation rules	-	
	9	Authorisation regime	Licence exemption	
	10	Additional essential requirements	-	
	11	Frequency planning assumptions	-	
Informative part	12	Planned changes	-	
	13	Reference	Decision 2014/702/EU amending Decision 2007/131/EC; EN 302 435; EN 302 498	
	14	Notification number	2015/139/RO	
	15	Remarks	<p><i>Emissions radiating from material sensing devices permitted under this technical regulation shall be kept to a minimum and in any case not exceed the e.i.r.p. density limits within the table. The compliance with the limits for non-fixed installations (application B) has to be ensured with the device on a representative structure of the investigated material (e.g. representative wall as defined in EN 302 435-1 or EN 302 498-1).</i></p> <p><i>The peak power (in dBm) measured in a bandwidth of 50 MHz shall be less than a limit that is obtained by adding a conversion factor (25 dB) to the "maximum mean power spectral density" (in dBm/MHz) limit.</i></p> <p><i>(¹) Devices using a Listen Before Talk (LBT) mechanism, as described in the harmonised standard EN 302 498-2, are permitted to operate in frequency ranges 2.5 to 2.69 and 2.9 to 3.4 GHz with a maximum mean power spectral density of – 50 dBm/MHz.</i></p> <p><i>(²) To protect the radio services, non-fixed installations (application B) must fulfil the following requirements for total radiated power spectral density:</i></p> <p><i>a) In the frequency ranges 2.5 to 2.69 GHz and 4.8 to 5 GHz, the total radiated power spectral density has to be 10 dB below the maximum mean power spectral density;</i></p> <p><i>b) In the frequency range 3.4 to 3.8 GHz, the total radiated power spectral density has to be 5dB below the maximum mean power spectral density.</i></p> <p><i>(³) Limitation of the Duty Cycle to 10 % per second.</i></p>	