

**2009 No. 2517**

**ELECTRONIC COMMUNICATIONS**

**The Wireless Telegraphy (Ultra-Wideband Equipment)  
(Exemption) Regulations 2009**

*Made* - - - - *16th September 2009*

*Coming into force* - - *15th October 2009*

The Office of Communications (“OFCOM”) make the following Regulations in exercise of the powers conferred by section 8(3) of the Wireless Telegraphy Act 2006 (the “Act”)(a).

Before making these Regulations OFCOM have given notice of their proposal to do so in accordance with section 122(4)(a) of the Act, published notice of their proposal in accordance with 122(4)(b) of the Act and have considered the representations made to them before the time specified in that notice in accordance with section 122(4)(c) of the Act.

**PART 1**

**INTRODUCTORY**

**Citation and commencement**

1. These Regulations may be cited as the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2009 and shall come into force on 15th October 2009.

**Revocation**

2. The Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2007(b) and The Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) (Amendment) Regulations 2007(c) are hereby revoked.

**Interpretation**

3. In these regulations—

“automotive vehicle” has the meaning given for “vehicle” by Article 2 of Council Directive 70/156/EEC of 6 February 1970 on the approximation of the laws of the Member States

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(a) 2006 c. 36. Section 8(3) was extended to the Bailiwick of Guernsey by article 2 of the Wireless Telegraphy (Guernsey) Order 2006 (S.I. 2006/3325); and to the Bailiwick of Jersey by article 2 of the Wireless Telegraphy (Jersey) Order 2006 (S.I. 2006/3324); and to the Isle of Man by article 2 of the Wireless Telegraphy (Isle of Man) Order 2007 (S.I. 2007/278).

(b) S.I. 2007/2084

(c) S.I. 2007/2440

relating to the type-approval of motor vehicles and their trailers(a);

“building material analysis equipment” means a field disturbance sensor that is designed to detect the location of objects within a building structure or to determine the physical properties of building material;

“dB” means decibel;

“dBm” means decibels of power referenced to one milliWatt;

“dBm/MHz” means decibels of power referenced to one milliWatt per megahertz;

“e.i.r.p.” means equivalent isotropic radiated power;

“equivalent transmission level” means the peak level of transmission contained within a bandwidth which is other than 50 MHz, centred on the frequency at which the highest mean radiated power occurs, and which is the relevant maximum peak e.i.r.p. scaled down by a factor of  $20\log(50/x)$ dB, where “x” is the bandwidth expressed in MHz;

“GHz” means gigahertz;

“harmonised standards” has the meaning given in regulation 7(1)(a);

“indoors” means inside buildings or places in which the shielding will typically provide the necessary attenuation to protect wireless telegraphy against harmful interference;

“low duty cycle mitigation technique” means a technique which is used to limit the length of time of transmissions made from ultra-wideband equipment;

“mean e.i.r.p. density” means the mean e.i.r.p. measured with a 1 MHz resolution bandwidth, a root-mean-square detector and an averaging time of one millisecond or less;

“MHz” means megahertz;

“peak e.i.r.p. density” means the peak e.i.r.p. contained within a 50 MHz bandwidth centred on the frequency at which the highest mean radiated power occurs;

“radiated into the air” means, in relation to a signal, those parts of the signal emitted by ultra-wideband equipment which are not absorbed by shielding or by material under investigation;

“railway vehicle” has the meaning given by Article 3 of Regulation (EC) No 91/2003 of the European Parliament and of the Council of 16 December 2002 on rail transport statistics(b);

“the Act” means the Wireless Telegraphy Act 2006;

“total radiated power density” means the average of the values of the mean e.i.r.p. density measured at points in a sphere around an item of building material analysis equipment, where there is at least 15 degrees between each measurement point;

“transmitter power control mechanism” means a mechanism that mitigates interference arising from the aggregate power from a number of items of ultra-wideband equipment by reducing the amount of power necessary for those apparatus to operate; and

“ultra-wideband equipment” means a wireless telegraphy station or wireless telegraphy 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 wireless telegraphy.

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- (a) OJ No L 42, 23.2.70, p1. Article 2 was amended by Council Directive No 92/53/EEC amending Council Directive 70/156/EEC on the approximation of laws of the Member States relating to the type-approval of motor vehicles and their trailers, OJ No L 225, 10.8.92, p1. There are other amendments to Article 2 and to other parts of Council Directive 70/156/EEC not relevant to these Regulations.
- (b) OJ No L 14, 21.1.03, p1. Article 3 was amended by Commission Regulation (EC) No 1192/2003 amending Regulation (EC) No 91/2003 of the European Parliament and of the Council on rail transport statistics, OJ No L 167, 4.7.2003, p13. Regulation (EC) No 91/2003 has also been amended by Commission Regulation (EC) No 1304/2007, OJ No L 290, 8.11.07, p14 and by Regulation (EC) No 219/2009 of the European Parliament and of the Council, OJ L 87, 31.3.09, p109.

**PART 2**  
**GENERAL USE OF ULTRA-WIDEBAND EQUIPMENT**

**Exemption**

4. The establishment, installation or use of ultra-wideband equipment complying with the terms, provisions and limitations in regulation 5 is hereby exempt from the provisions of section 8(1) of the Act.

**Terms, provisions and limitations**

5.—(1) The exemption provided for in regulation 4 shall apply to ultra-wideband equipment which complies with the requirements of paragraphs (2) to (4) of this regulation.

(2) The ultra-wideband equipment must be used—

- (a) indoors; or
- (b) other than indoors provided it is not—
  - (i) attached to a fixed installation;
  - (ii) attached to fixed infrastructure;
  - (iii) attached to a fixed outdoor antenna; or
  - (iv) attached to, or used in, an automotive vehicle or a railway vehicle.

(3) The ultra-wideband equipment must not cause or contribute to undue interference to other users of the electromagnetic spectrum.

(4) The ultra-wideband equipment must—

- (a) emit transmissions which are in accordance with the condition in regulation 6; or
- (b) operate using mitigation techniques described in regulation 7 to reduce interference to other users of the electromagnetic spectrum.

**Transmission limits**

6. The condition referred to in regulation 5(4)(a) is that the ultra-wideband equipment only emits transmissions which—

- (a) in frequencies up to 1.6 GHz when measured in any direction have—
  - (i) a maximum mean e.i.r.p. density no greater than -90.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -50.0 dBm or the equivalent transmission level;
- (b) in the frequency band 1.6 GHz to 2.7 GHz when measured in any direction have—
  - (i) a maximum mean e.i.r.p. density no greater than -85.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -45.0 dBm or the equivalent transmission level;
- (c) in the frequency band 2.7 GHz to 3.4 GHz when measured in any direction have—
  - (i) a maximum mean e.i.r.p. density no greater than -70.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -36.0 dBm or the equivalent transmission level;
- (d) in the frequency band 3.4 GHz to 3.8 GHz when measured in any direction have—
  - (i) a maximum mean e.i.r.p. density no greater than -80.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -40.0 dBm or the equivalent transmission level;
- (e) in the frequency band 3.8 GHz to 4.2 GHz when measured in any direction have—

- (i) a maximum mean e.i.r.p. density no greater than -70.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -30.0 dBm or the equivalent transmission level;
- (f) in the frequency band 4.2 GHz to 4.8 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level;
- (g) in the frequency band 4.8 GHz to 6.0 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -70.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -30.0 dBm or the equivalent transmission level;
- (h) in the frequency band 6.0 GHz to 8.5 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level;
- (i) in the frequency band 8.5 GHz to 10.6 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -65.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -25.0 dBm or the equivalent transmission level; and
- (j) in frequency bands above 10.6 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -85.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -45.0 dBm or the equivalent transmission level.

### Mitigation techniques

7.—(1) The mitigation techniques referred to in regulation 5(4)(b) are—

- (a) techniques for mitigating interference described in harmonised standards for ultra-wideband equipment whose reference numbers have been published in the Official Journal of the European Union under Article 5 of Council Directive 1999/5/EC on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity<sup>(a)</sup> (“harmonised standards”); or
- (b) techniques for mitigating interference which achieve at least an equivalent level of protection from interference to other users of the electromagnetic spectrum as that provided by the condition in regulation 6.

(2) The techniques that may be used under regulation 7(1)(b) for equipment operating in the frequency band 3.1 GHz to 4.8 GHz include a low duty cycle mitigation technique which results in transmissions which—

- (a) when measured in any direction, have a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz;
- (b) do not exceed five milliseconds in duration;
- (c) for any second, the sum of all transmitted signals is less than 5% of that second;
- (d) for any hour, the sum of all transmitted signals is less than 0.5% of that hour; and

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(a) OJ No L 91, 7.4.1999, p10. Council Directive 1999/5/EC has been amended by Regulation (EC) No 1882/2003 of the European Parliament and of the Council, OJ L 284, 31.10.03, p1 although these amendments do not amend Article 5. Relevant harmonised standards are published by the European Telecommunications Standards Institute and include EN 302 065 (Version 1.1.1) published in February 2008; EN 302 500-1 (Version 1.2.1) published in June 2008; EN 302 500-2 (Version 1.2.1) published in June 2008; EN 302 435-1 (Version 1.3.1) published in August 2009; EN 302 435-2 (Version 1.3.1) published in August 2009.

(e) have a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level.

(3) The techniques that may be used under regulation 7(1)(b) also include, for equipment operating in the frequency band 3.1 GHz to 4.8 GHz or in the frequency band 8.5 GHz to 9.0 GHz, a technique for detecting other transmissions and avoiding interference with those transmissions (described in harmonised standards) which results in transmissions which—

- (a) when measured in any direction, have a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz; and
- (b) have a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level.

## PART 3

### USE OF ULTRA-WIDEBAND EQUIPMENT IN AUTOMOTIVE VEHICLES AND RAILWAY VEHICLES

#### **Exemption**

**8.** The establishment, installation or use of ultra-wideband equipment complying with the terms, provisions and limitations in regulation 9 is hereby exempt from the provisions of section 8(1) of the Act.

#### **Terms, provisions and limitations**

**9.**—(1) The exemption provided for in regulation 8 shall apply to ultra-wideband equipment which complies with the requirements of paragraphs (2) to (4) of this regulation.

(2) The ultra-wideband equipment must be used in an automotive vehicle or in a railway vehicle.

(3) The ultra-wideband equipment must not cause or contribute to undue interference to other users of the electromagnetic spectrum.

(4) The ultra-wideband equipment must—

- (a) emit transmissions which are in accordance with the condition in regulation 10; or
- (b) operate using mitigation techniques described in regulation 11 to reduce interference to other users of the electromagnetic spectrum.

#### **Transmission limits**

**10.** The condition referred to in regulation 9(4)(a) is that the ultra-wideband equipment only emits transmissions—

(a) which—

- (i) in frequencies up to 4.2 GHz;
- (ii) in the frequency band 4.8 GHz to 6.0 GHz; and
- (iii) in frequencies above 8.5 GHz;

when measured in any direction, have a maximum mean e.i.r.p. density and a maximum peak e.i.r.p. density no greater than the limits prescribed for those frequencies in regulation 6; and

(b) which in the frequency band 4.2 GHz to 4.8 GHz and in the frequency band 6.0 GHz to 8.5 GHz—

- (i) when measured in any direction, have a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz provided that—

- (aa) a transmitter power control mechanism of at least 12 dB is used to mitigate interference that provides at least equivalent performance to techniques described in harmonised standards; and
  - (bb) the maximum peak e.i.r.p. density is no greater than 0.0 dBm or the equivalent transmission level; or
- (ii) when measured in any direction have a maximum mean e.i.r.p. density no greater than -53.3 dBm/MHz and a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level.

### **Mitigation techniques**

**11.**—(1) The mitigation techniques referred to in regulation 9(4)(b) are—

- (a) techniques for mitigating interference described in harmonised standards; or
- (b) techniques for mitigating interference which achieve at least an equivalent level of protection from interference to other users of the electromagnetic spectrum as that provided by the condition in regulation 10.

(2) The mitigation techniques that may be used under regulation 11(1)(b) for equipment operating in the frequency band 3.1 GHz to 4.8 GHz include a low duty cycle mitigation technique which results in transmissions which—

- (a) when measured in any direction, have a maximum mean e.i.r.p. density no greater than -41.3 dBm/MHz;
- (b) do not exceed five milliseconds in duration;
- (c) in any second, the sum of all transmitted signals is less than 5% of that second;
- (d) in any hour, the sum of all transmitted signals is less than 0.5% of that hour; and
- (e) have a maximum peak e.i.r.p. density no greater than 0.0 dBm or the equivalent transmission level.

(3) The mitigation techniques that may be used under regulation 11(1)(b) also include, for equipment operating in the frequency band 3.1 GHz to 4.8 GHz or in the frequency band 8.5 GHz to 9.0 GHz, a technique for detecting other transmissions and avoiding interference with those transmissions (described in harmonised standards) which results in transmissions which—

- (a) when measured in any direction, have a maximum e.i.r.p. density no greater than -41.3 dBm/MHz provided that—
  - (i) a transmitter power control mechanism of at least 12 dB is used to mitigate interference; and
  - (ii) the maximum peak e.i.r.p. density is no greater than 0.0 dBm or the equivalent transmission level; or
- (b) when measured in any direction, have a maximum e.i.r.p. density no greater than -53.3 dBm/MHz.

## **PART 4**

### **USE OF ULTRA-WIDEBAND EQUIPMENT FOR BUILDING MATERIAL ANALYSIS**

#### **Exemption**

**12.** The establishment, installation or use of ultra-wideband equipment complying with the terms, provisions and limitations in regulation 13 is hereby exempt from the provisions of section 8(1) of the Act.

## Terms, provisions and limitations

13.—(1) The exemption provided for in regulation 12 shall apply to ultra-wideband equipment which is also building material analysis equipment and which complies with the requirements of paragraphs (2) and (3) of this regulation.

(2) The ultra-wideband equipment must not cause or contribute to undue interference to other users of the electromagnetic spectrum.

- (3) The ultra-wideband equipment must only emit signals that are radiated into the air which—
- (a) in the frequencies up to 1.215 GHz when measured in any direction have—
    - (i) a maximum mean e.i.r.p. density no greater than -85.0 dBm/MHz; and
    - (ii) a maximum peak e.i.r.p. density no greater than -45.0 dBm or the equivalent transmission level;
  - (b) in the frequency band 1.215 GHz to 1.73 GHz when measured in any direction—
    - (i) have a maximum mean e.i.r.p. density —
      - (aa) no greater than -85.0 dBm/MHz; or
      - (bb) no greater than -70.0 dBm/MHz provided that techniques are used to mitigate interference to other users of the electromagnetic spectrum which provide at least equivalent performance to techniques described in harmonised standards; and
    - (ii) have a maximum peak e.i.r.p. density no greater than -45.0 dBm or the equivalent transmission level;
  - (c) in the frequency band 1.73 GHz to 2.2 GHz when measured in any direction have—
    - (i) a maximum mean e.i.r.p. density no greater than -65.0 dBm/MHz; and
    - (ii) a maximum peak e.i.r.p. density no greater than -25.0 dBm or the equivalent transmission level;
  - (d) in the frequency band 2.2 GHz to 2.5 GHz when measured in any direction have—
    - (i) a maximum mean e.i.r.p. density no greater than -50.0 dBm/MHz; and
    - (ii) a maximum peak e.i.r.p. density no greater than -10.0 dBm or the equivalent transmission level;
  - (e) in the frequency band 2.5 GHz to 2.69 GHz when measured in any direction—
    - (i) have a maximum mean e.i.r.p. density —
      - (aa) no greater than -65.0 dBm/MHz; or
      - (bb) no greater than -50.0 dBm/MHz provided that techniques are used to mitigate interference to other users of the electromagnetic spectrum which provide at least equivalent performance to techniques described in harmonised standards; and
    - (ii) have a maximum peak e.i.r.p. density no greater than -25.0 dBm or the equivalent transmission level;
  - (f) in the frequency band 2.69 GHz to 2.7 GHz when measured in any direction have—
    - (i) a maximum mean e.i.r.p. density no greater than -55.0 dBm/MHz;
    - (ii) a maximum peak e.i.r.p. density no greater than -15.0 dBm or the equivalent transmission level; and
    - (iii) a maximum total radiated power density below -65.0 dBm/MHz;
  - (g) in the frequency band 2.7 GHz to 3.4 GHz when measured in any direction—
    - (i) have a maximum mean e.i.r.p. density —
      - (aa) no greater than -82.0 dBm/MHz; or
      - (bb) no greater than -50.0 dBm/MHz provided that techniques are used to mitigate interference to other users of the electromagnetic spectrum which provide at



least equivalent performance to techniques described in harmonised standards;  
and

- (ii) have a maximum peak e.i.r.p. density no greater than -42.0 dBm or the equivalent transmission level;
- (h) in the frequency band 3.4 GHz to 4.8 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -50.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -10.0 dBm or the equivalent transmission level;
- (i) in the frequency band 4.8 GHz to 5.0 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -55.0 dBm/MHz;
  - (ii) a maximum peak e.i.r.p. density no greater than -15.0 dBm or the equivalent transmission level; and
  - (iii) a maximum total radiated power density below -65.0 dBm/MHz;
- (j) in the frequency band 5.0 GHz to 8.0 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -50.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -10.0 dBm or the equivalent transmission level;
- (k) in the frequency band 8.0 GHz to 8.5 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -70.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -30.0 dBm or the equivalent transmission level; and
- (l) in the frequency bands above 8.5 GHz when measured in any direction have—
- (i) a maximum mean e.i.r.p. density no greater than -85.0 dBm/MHz; and
  - (ii) a maximum peak e.i.r.p. density no greater than -45.0 dBm or the equivalent transmission level.

16th September 2009

*Ed Richards*  
Chief Executive of the Office of Communications  
For and by authority by the Office of Communications



## EXPLANATORY NOTE

*(This note is not part of the Regulations)*

These Regulations give effect to Commission Decision 2009/343/EC(a) on allowing the use of radio spectrum equipment using ultra-wideband technology in a harmonised manner in the Community.

The Regulations exempt the establishment, installation or use of equipment using ultra-wideband technology from the requirement to be licensed under section 8(1) of the Wireless Telegraphy Act 2006 (c.36) (“the Act”).

Part 2 of the Regulations provides an exemption for the general use of ultra-wideband equipment (complying with certain terms, provisions and limitations) from the need to be licensed under the Act.

Part 3 of the Regulations provides an exemption for ultra-wideband equipment (complying with certain terms, provisions and limitations) used in an automotive vehicle or a railway vehicle.

Part 4 of the Regulations provides an exemption for use of ultra-wideband equipment (complying with certain terms, provisions and limitations) for building material analysis.

These regulations revoke and replace the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption) Regulations 2007 (S.I.2007/2084) and the Wireless Telegraphy (Ultra-Wideband Equipment) (Exemption)(Amendment) Regulations 2007 (S.I. 2007/2440).

The harmonised standards referred to in the footnote to regulation 7(1)(a) are available to the public on the ETSI website at <http://www.etsi.org> or from the ETSI Secretariat at 650 Route des Lucioles, 06921 Sophia-Anitpoles Cedex, France (Tel: +33 4 92 94 42 00).

A full list of all the harmonised standards for ultra-wideband equipment whose reference numbers have been published in the Official Journal of the European Union under Article 5 of Council Directive 1999/5/EC can be found on the European Commission internet website at: <http://ec.europa.eu/enterprise/newapproach/standardization/harmstds/reflist/radiotte.html>.

A full impact assessment and report of the effect of the Regulations will have on the costs to business is available from Ofcom at Riverside House, 2a Southwark Bridge Road, London, SE1 9HA (tel: 020 7981 3000) or on the OFCOM internet web site at [www.ofcom.org.uk](http://www.ofcom.org.uk). Copies of this report have also been placed in the libraries of both Houses of Parliament.

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(a) OJ No L 105, 25.4.2009, p9