

STATEMENT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

EQUIPMENT

Type of equipment:	ConnectMe unit
Brand name:	ConnectMe
Type / Model:	331495
Manufacturer:	Permobil AB
By request of:	Wireless System Integration Sweden AB

STANDARD

47 CFR §2.109, §1.1310,
RSS 102 Issue 5
KDB 447498 D01 v06
EN 62311 (2008)

Radio protection standard Maximum Exposure Levels to Radiofrequency Fields 3 kHz – 300 MHz
Radiation protection series 3 Reference levels for time averaged exposure to RMS electric and magnetic fields general public

POWER LEVELS AND ANTENNA DISTANCE

The 3G module's maximum output power including tune up tolerance is as follows

GSM 850: +33 dBm

GSM 900: +33 dBm

DCS 1800: +30 dBm

PCS 1900: +30 dBm

B1 +24 dBm

B2 + 24 dBm

B5 + 24 dBm

B6 + 24 dBm

B8 + 24 dBm

B19 + 24 dBm

Bluetooth low energy transmitter's maximum EIRP on 2440 MHz is + 3.1 dBm and. The maximum output power for of BLE (+3.1 dBm) is below the exemption limit of 2.7 W (exemption limit at 2440 MHz). Both transmitters can transmit simultaneously and are considered co-located. The EUT is sits on wheel chair in location that provides minimum 20 cm separation from user and bystanders.

LIMITS

47 CFR §1.1310

(B) Limits for General Population/Uncontrolled Exposure				
Frequency range (MHz)	Electric field strength (V/m)	Magnetic field strength (A/m)	Power density (mW/cm ²)	Averaging time (minutes)
0.3-1.34	614	1.63	*100	30
1.34-30	824/f	2.19/f	*180/f ²	30
30-300	27.5	0.073	0.2	30
300-1,500			f/1500	30
1,500-100,000			1.0	30

RSS 102 Issue 5 Exemption Limits for Routine Evaluation — RF Exposure Evaluation

Frequency range (MHz)	e.i.r.p (W)
< 20	1 W
20 – 48	22.48/f ^{0.5}
48 – 300	0.6
300 – 6000	1.31 × 10 ⁻² f ^{0.6834}
> 6000	5

RSS 102 Issue 5 RF field strength limits for general population

Frequency Range (MHz)	Electric Field (V/m rms)	Magnetic Field (A/m rms)	Power Density (W/m ²)	Reference Period (minutes)
0.003-10	83	90	-	Instantaneous*
0.1-10	-	0.73/ f	-	6
1.1-10	87/ $f^{0.5}$	-	-	6
10-20	27.46	0.0728	-2	6
20-48	58.07/ $f^{0.25}$	0.1540/ $f^{0.25}$	8.944/ $f^{0.5}$	6
48-300	22.06	0.05852	1.291	6
300-6000	3.142 $f^{0.3417}$	0.008335 $f^{0.3417}$	0.02619 $f^{0.6834}$	6
6000-15000	61.4	0.163	10	6
15000-150000	61.4	0.163	10	616000/ $f^{1.2}$
150000-300000	0.158 $f^{0.5}$	4.21 x 10 ⁻⁴ $f^{0.5}$	6.67 x 10 ⁻⁵ f	616000/ $f^{1.2}$

 $f = \text{MHz}$

COUNCIL RECOMMENDATION 1999/519/EC reference levels for electric, magnetic and electromagnetic fields

Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (μT)	Equivalent plane wave power density Seq(W/m ²)
0-1 Hz	-	3,2x10 ⁴	4x10 ⁴	-
1-8 Hz	10000	3,2x10 ⁴ / f^2	4x10 ⁴ / f^2	-
8-25 Hz	10000	4000/ f	5000/ f	-
0,025-0,8 kHz	250/ f	4/ f	5/ f	-
0,8-3 kHz	250/ f	5	6,25	-
3-150 kHz	87	5	6,25	-
0,15-1 MHz	87	0,73/ f	0,92/ f	-
1-10 MHz	87/ $f^{0.5}$	0,73/ f	0,92/ f	-
10-400 MHz	28	0,073	0,092	2
400-2000 MHz	1,375 $f^{0.5}$	0,0037 $f^{0.5}$	0,0046 $f^{0.5}$	f/200
2-300 GHz	61	0,16	0,20	10

Radio protection standard Maximum Exposure Levels to Radiofrequency Fields 3 kHz – 300 MHz Radiation protection series 3
Reference levels for time averaged exposure to RMS electric and magnetic fields general public

Frequency range	E-field strength (V/m rms)	H-field strength (A/m rms)	Equivalent plane wave power flux density Seq (W/m ²)
100 – 150 kHz	86,8	4,86	-
150 – 1000 kHz	86,8	0,729 / f	-
1 – 10 MHz	86,8	0,729 / f	-
10 – 400 MHz	86,8 / f ^{0,5}	0,0729	2
400 – 2000 MHz	1,37 x f ^{0,5}	0,00364 x f ^{0,5}	f / 200
2 – 300 GHz	61,4	0,163	10

CALCULATIONS

A worst case calculation without time averaging for power density is as follows:

$$S = \frac{DC \times EIRP}{4 \times \pi \times r^2}$$

DC = $\frac{1}{8}$ for GSM, PCS and DCS 1 for other transmitters

S = power density

R = 20 cm

EIRP = equivalent isotropic radiated power (W)

GSM 850 = 0,5 W/m²

GSM 900 = 0,5 W/m²

DCS 1800 = 0,25 W/m²

PCS 1900 = 0,25 W/m²

B1 = 1980 MHz = 0,50 W/m²

B2 = 1910 MHz = 0,50 W/m²

B5 = 849 MHz = 0,50 W/m²

B8 = 915 MHz = 0,50 W/m²

BLE = 0,004 W/m²

All transmitters fulfil requirements without testing in standalone conditions.

Simultaneous transmission conditions

Under simultaneous transmission conditions the sum of ratio of each transmitter to the corresponding limit shall be less than unity.

$$\sum_{i=1}^n \frac{S_i}{MPE_i} < 1$$

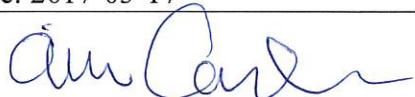
	§1.1310	RSS-102	EN 62311	RPS 3
BLE and GSM 850	0.09	0.19	NA	0.12
BLE and GSM 900	NA	NA	0.11	0.11
BLE and DCS 1800	NA	NA	0.03	0.03
BLE and PCS 1900	0.06	0.06	NA	NA

	§1.1310	RSS-102	EN 62311	RPS 3
BLE and B1	NA	NA	0.05	0.05
BLE and B2	0.05	0.11	NA	NA
BLE and B5	0.08	0.19	NA	0.11
BLE and B8	NA	NA	0.11	0.11

The EUT fulfils all requirements un simultaneous transmission conditions

Intertek Semko AB, Radio& EMC

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