

REPORT ON EXPOSURE TO ELECTROMAGNETIC FIELDS

No. 2103038STO-110

EQUIPMENT

Equipment: Radio to USB ATB Protocol Converter
Type/Model: USBRF-2.4G
Manufacturer: WESTLINE sarl
Tested by request of: C-RAD Positioning AB

SUMMARY

Based on the assessment in this statement, the equipment is determined to **comply** with the following requirements without testing:

EN 50663: 2017

Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014

NZS 2772.1:1999

Date of issue: May 2, 2022

Tested by:


Ala El-Haery


Björn Utermöhl

Approved by:


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Revision History

Test report number	Date	Description	Changes
2103038STO-102	November 26, 2021	First release	--
2103038STO-106	April 26, 2022	Second release	Referral to updated test report and updated TX frequency range
2103038STO-110	May 2, 2022	Third release	Correction of transmitting frequency range declaration

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1 CLIENT INFORMATION

This assessment has been done by request of:

Company	C-RAD Positioning AB Sjukhusvägen 12 K Uppsala 753 09 Sweden
Name of contact	Johan Bostedt Phone +46 70 6576470
Manufacturer	WESTLINE sarl 20 rue du Buisson Richard 78600 Le Mesnil le Roi FRANCE

2 EQUIPMENT

2.1 Identification of the equipment

Equipment:	Radio to USB ATB Protocol Converter
Type/Model:	USBRF-2.4G
Brand name:	WESTLINE
Manufacturer:	WESTLINE sarl
Transmitter frequency range:	2400 – 2483,5 MHz
Measured output power eirp ¹ :	-2,7 dBm
Declared output power eirp ² :	-2,0 dBm
Antenna gain ² :	0,0 dBi
Measured duty cycle:	96,4%
User separation distance:	5mm
Exposure conditions:	☐ Controlled environment (occupational) ☒ Uncontrolled environment (general population)
Region of body:	☒ Head or trunk ☐ Limbs

¹Reference for measurement: Intertek test report 2103038STO-109

²Declared by C-RAD Positioning AB

3 TEST SPECIFICATIONS

3.1 Standards

EN 50663: 2017: Generic standard for assessment of low power electronic and electrical equipment related to human exposure restrictions for electromagnetic fields (10 MHz - 300 GHz)

EN 62479:2010, Assessment of the compliance of low power electronic and electrical equipment with the basic restrictions related to human exposure to electromagnetic fields (10 MHz to 300 GHz)

Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014

NZS 2772.1:1999 Radiofrequency fields – Maximum exposure levels – 3 kHz to 300 GHz

3.2 Additions, deviations and exclusions from standards

No additions, deviations or exclusions have been made from standards.

3.3 Decision rule

The statements of conformity are reported as:

Passed – When the measured values are within the specified limits.

Failed – When one or more measures values are outside the specified limits

4 SUMMARY

The evaluation has been carried out at the Intertek Semko AB premises in Kista, Sweden.

The results in this report apply only to sample tested:

Test	Result
RF Exposure, single transmitter	PASS
RF Exposure, multiple simultaneous transmitters	NA ¹

¹EUT only has a single transmitter or transmitters cannot operate simultaneously

5 RF EXPOSURE, SINGLE TRANSMITTER

Result:	PASS
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5.1 Limits

Reference: COUNCIL RECOMMENDATION of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) 1999/519/EC: Annex 2 Basic restrictions

Guideline / standard	SAR limit, SAR _{max} W/kg	Averaging mass, m g	P _{max} mW	Exposure tier	Region of body
199/519/EC	2	10	20	General public	Head and trunk
	4	10	40	General public	Limbs

Reference: Directive 2013/35/EU of the European Parliament and of the Council of 26 June 2013 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields): Annex III table A1

Guideline / standard	SAR limit, SAR _{max} W/kg	Averaging mass, m g	P _{max} mW	Exposure tier	Region of body
2013/35/EU	10	10	100	Occupational	Head and trunk
	20	10	200	Occupational	Limbs

Reference: Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz, Table S1: Summary of compliance provisions for mobile or portable transmitting equipment.

Equipment parameters	Test exemption	Spatial peak SAR [Table 2 Occupational]	Spatial peak SAR [Table 2 General Public]
Aware user exposure			
Mean power < 100 mW	X		
Mean power < alternative low-power exclusion level of IEC 62479 for SAR _{max} = 10 W/kg	X		
Mean power > 100 mW & separation > 20 cm			
Otherwise		X	
General public exposure			
Mean power < 20 mW	X		
Mean power < alternative low-power exclusion level of IEC 62479 for SAR _{max} = 2 W/kg	X		
Mean power > 20 mW & separation > 20 cm			
Otherwise			X

Reference: NZS 2772.1:1999

Section 3.7.3: In some circumstances an RF exposure evaluation may not be required. This is the case with low-power devices whose nominal average RF radiated power does not exceed 20 mW and which do not produce exceptionally high instantaneous fields.

5.2 Calculations

EIRP: $Power\ to\ antenna\ (dBm) + Antenna\ gain\ (dBi) = EIRP\ dBm$
Declared EIRP = -2,0 dBm
Measured EIRP = -2,7 dBm

Conversion dBm to W:

Declared, EIRP: $1\ mW * 10^{\left(\frac{EIRP_{dBm}}{10}\right)} = +0,7\ mW$
Measured, EIRP: $1\ mW * 10^{\left(\frac{EIRP_{dBm}}{10}\right)} = +0,6\ mW$

5.3 Results

Standard	Reference for limit	Value	Unit	Limit	Result
EN 50663: 2017	EN 62479	0,7	mW	< 20	PASS
Radiocommunications (Electromagnetic Radiation – Human Exposure) Standard 2014	Radiation Protection Standard for Maximum Exposure Levels to Radiofrequency Fields – 3 kHz to 300 GHz	0,7	mW	< 20	PASS
NZS 2772.1:1999	NZS 2772.1:1999	0,7	mW	< 20	PASS