EMI – TEST REPORT

- Human Exposure -

Type / Model Name	:	A-07-12
Product Description	:	UWB Anchor
Applicant	:	Kinexon Sports & Media Inc.
Address	:	22 west 38th
		New York, NY 10018
Manufacturer	:	Kinexon GmbH
Address	:	Schellingstraße 35
		80799 München
Licence holder	:	Kinexon Sports & Media Inc.
Address	:	22 west 38th
		New York, NY 10018

Test Result according to the standards listed in clause 1 test standards:	**POSITIVE**

Test Report No. : T43015-00-02GK	20. July 2017 Date of issue

Deutsche Akkreditierungsstelle
D-PL-12030-01-01
D-PL-12030-01-02

The test report merely corresponds to the test sample. It is not permitted to copy extracts of these test results without the written permission of the test laboratory.

Contents

1 TEST STANDARDS

The tests were performed according to following standards:

FCC Rules and Regulations Part 1, Subpart I - Procedures Implementing the National Environmental Policy Act of 1969

Part 1, Subpart I, Section 1.1310	Radiofrequency radiation exposure limits
Part 1, Subpart 2, Section 2.1091	Radiofrequency radiation exposure evaluation: **mobile devices**.
Part 1, Subpart 2, Section 2.1093	Radiofrequency radiation exposure evaluation: **portable devices**.

OET Bulletin 65, 65A, 65B Edition 97-01, August 1997 – Evaluating Compliance with FCC Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields.

KDB 447498 D01 v06	Mobile and portable devices RF Exposure procedures and equipment authorisation policies, October 23, 2015.
KDB 865664 D01 v01r04	SAR Measurement Requirements for 100 MHz to 6 GHz, August 7, 2015.
ANSI C95.1: 2005	IEEE Standard for Safety Levels with respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz
ETSI TR 100 028 V1.3.1: 2001-03,	Electromagnetic Compatibility and Radio Spectrum Matters (ERM); Uncertainties in the Measurement of Mobile Radio Equipment Characteristics—Part 1 and Part 2

2 EQUIPMENT UNDER TEST

2.1 Photo documentation of the EUT – See ATTACHMENT A

2.2 Equipment type, category

Fixed UWB device

2.3 Short description of the equipment under test (EUT)

The technology is used in sports as well as industrial environments.
Kinexon Anchors communicate with each other and nearby Tags to obtain information on the Tag positions.

Additionally the EUT has an integrated WLAN /Bluetooth low energy module with one integrated antenna.
This module is certified and has the FCC ID: 2AB8ZND1

Number of tested samples:	2 (1 radiated and1 conducted sample)
Serial number:	pre-production sample
Firmware version:	2.9.0

EUT configuration:
(The CDF filled by the applicant can be viewed at the test laboratory.)

2.4 Variants of the EUT

2.5 Operation frequency and channel plan

The operating frequency band of UWB is 3100 MHz to 10600 MHz.

Channel plan:

Channel 1: 3494.4 MHz

Channel 2: 3993.6 MHz

Channel 3: 4492.8 MHz

Channel 5: 6489.6 MHz

BLE is working in the frequency range 2400 MHz to 2483.5 MHz

WLAN is working in the frequency range 2400 MHz to 2483.5 MHz and 5180 MHz to 5825 MHz

2.6 Antennas

The following antennas shall be used with the EUT:

UWB:
Mounted antennas with following gain: 4.15 dBi peak

Bluetooth low energy and WLAN: integrated antenna

2.7 Power supply system utilised

Power supply voltage, V_{nom} 115 V AC 60 Hz

Note: The EUT has a DC socket which can be powered with 12 V to 24 V DC. The measurements were performed with a power adapter from the shelf (ETSA120330UD), additionally the conducted emissions measurement was performed with a PoE adapter from TP-Link.

Additionally the EUT can be powered over Ethernet. A PoE adapter from TP-Link (TL-SF1008P) was used.

3 TEST RESULT SUMMARY

FCC Rule Part	Description	Result
15.247(i)	MPE	passed
15.247(i)	SAR exclusion consideration	not applicable
OET Bulletin 65	Co-location, Co-transmission	passed

3.1 Final assessment

The equipment under test fulfills the EMI requirements cited in clause 1 test standards.

Date of receipt of test sample : acc. to storage records

Testing commenced on : 20 July 2017

Testing concluded on : 20 July 2017

Checked by:

Klaus Gegenfurtner
I confirm the correctness and Integrity of this document
2017.07.20 16:08:49 +02'00'

Klaus Gegenfurtner
Teamleader Radio

Tested by:

Konrad Graßl
I am the author of this document
2017.07.20 16:08:09 +02'00'

Konrad Graßl
Radio Team

4 TEST ENVIRONMENT

4.1 Address of the test laboratory

CSA Group Bayern GmbH
Ohmstrasse 1-4
94342 STRASSKIRCHEN
GERMANY

4.2 Environmental conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15-35 °C
Humidity:	30-60 %
Atmospheric pressure:	86-106 kPa

4.3 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. It is noted that the expanded measurement uncertainty corresponds to the measurement results from the standard measurement uncertainty multiplied by the coverage factor k = 2. The true value is located in the corresponding interval with a probability of 95 % The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16-4-2 / 11.2003 „Uncertainties, statistics and limit modelling – Uncertainty in EMC measurements“ and is documented in the quality system acc. to DIN EN ISO/IEC 17025. For all measurements shown in this report, the measurement uncertainty of the test laboratory, CSA Group Bayern GmbH, is below the measurement uncertainty as defined by CISPR. Therefore, no special measures must be taken into consideration with regard to the limits according to CISPR. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Measurement Type	Range	Confidence Level	Calculated Uncertainty
AC power line conducted emissions	0.15 MHz to 30 MHz	95%	± 3.29 dB
EBW and OBW	2400 MHz to 3000 MHz	95%	$\pm 2.5 \times 10^{-7}$
Maximum peak conducted output power	2400 MHz to 3000 MHz	95%	± 0.62 dB
Power spectral density	2400 MHz to 3000 MHz	95%	± 0.62 dB
Conducted Spurious Emissions	9 kHz to 10000 MHz	95%	± 2.15 dB
Conducted Spurious Emissions	10000 MHz to 40000 MHz	95%	± 3.47 dB
Radiated Spurious Emissions	9 kHz to 30 MHz	95%	± 3.53 dB
Radiated Spurious Emissions	30 MHz to 1000 MHz	95%	± 3.71 dB
Radiated Spurious Emissions	1000 MHz to 10000 MHz	95%	± 2.34 dB
Field strength of the fundamental	100 kHz to 100 MHz	95%	± 3.53 dB

4.4 Measurement protocol for FCC and ISED

4.4.1 General information

The Open Area test site is a listed Open Site under the Canadian Test-Sites File-No:

IC 3009A-1

The Anechoic chamber is a listed test site under the Canadian Test-Sites File-No:

IC 3009A-2

In compliance with RSS 247 testing for RSS compliance may be achieved by following the procedures set out in ANSI C63.10 and applying the CISPR 22 limits.

5 TEST CONDITIONS AND RESULTS

6 HUMAN EXPOSURE

6.1 Maximum permissible exposure (MPE)

UWB:
According to §2.1091 (c) the UWB technology (§15.517) is not in consideration for human exposure calculations.

BLE / WLAN:
The module is already certified and according to the grant it is complient with the MPE requirements at a distance of more than 20 cm between the user and the antenna structure.

The requirements are **FULFILLED.**

Remarks:

6.2 Co-location and Co-transmission

Remarks: Not applicable, because the UWB technology (§15.517) is according to §2.1091 (c) not in consideration for human Exposure calculations.

6.3 SAR test exclusion considerations

Remarks: Not applicable, because the EUT is a fixed equipment and the distance between the EUT and the user is more than 20 cm.