



**Pozyx
Industrial Tag v1
(IP66 - IP67)**



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Environmental Test Report

**EUT :
Pozyx
Industrial Tag v1**

Filename : ENV-040-2021

Date : 18 Aug. 2021



Pozyx Industrial Tag v1 (IP66 - IP67)



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Approval Sheet

Function title		Name	Signature	Date
Technical Manager	Author	Ivan Malfait		17 Aug. 2021
Managing Director	Reviewer	Mario Van de Velde		18 Aug. 2021





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Test Overview and Results

Test	Test Date	Test result
Degrees of protection provided by enclosures for electrical equipment against access to hazardous parts (IP6X code)	14 Jul. 2021	Pass
Degrees of protection provided by enclosures for electrical equipment against solid foreign objects (IP6X code)	14 ... 15 Jul. 2021	Pass
Degrees of protection provided by enclosures for electrical equipment against ingress of water (IPX7 code)	14 Jul. 2021	Pass
Degrees of protection provided by enclosures for electrical equipment against ingress of water (IPX6 code)	19 Jul. 2021	Pass

	<h1>Pozyx</h1> <h2>Industrial Tag v1</h2> <h3>(IP66 - IP67)</h3>	 <p>Joseph Cardijnstraat 21 9420 Erpe-Mere Tel : +32(0)53/43 23 04 BE 0882 166 104</p>
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Revision history

Document	Release	Release date	Author	Description
ENV-056-2020	01	18 Aug. 2021	Ivan Malfait	Initial release

Referenced data items

The table below lists all data items that are used or referenced to in this report (Categories : Customer info, Standards, Other info)

Document name	Release date	Revision	Category
EN 60529:1991 +A1:2000+A2:2013	2013	NA	Standard
IEC 60529:1989 +A1:1999+A2:2013	2013	NA	Standard

Abbreviations and acronyms

Abbreviation	
EUT	Equipment Under Test
RH	Relative Humidity



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1. EUT Description

1.1 EUT (ENV-040a-2021) Identification

EUT 1: Anchor: (used for IPX7 testing)

Name : Pozyx Industrial Tag v1
Item number : UWB-ID-200001518
Serial Number : NA



1.2 EUT (ENV-040b-2021) Identification

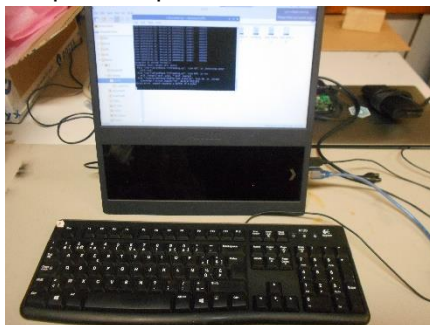
EUT 2: Anchor: (used for IP6X testing)

Name : Pozyx Industrial Tag
Item number : UWB-ID-200000112
Serial Number : NA



1.3 Associated Equipment

Rasp Pi computer



To activate/De-activate the Tags



Pozyx Creator Tag (configured as UWB sniffer)



1.4 Customer Identification

Manufacturer: Pozyx NV
Vrijdagmarkt 10/201
9000 Gent
Belgium

Offer Number: BGEMC-21-327-V2

2. Tests

Atmospheric conditions in test lab for test 2.1, 2.2 and 2.3

Ambient Temperature	:	23.0	°C
Ambient Relative Humidity	:	67	%RH
Water Temperature	:	21.1	°C



2.1 Degrees of protection provided by enclosures for electrical equipment against access to hazardous parts indicated by the first characteristic numeral (protection of persons) (IP6X)

2.1.1 Referenced Specification

Test Performed according EN 60529:1991 + A1:2000 + A2:2013

6	Protection against hazardous parts with a wire	1.0 mm probe
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2.1.2 Deviations from Test Procedure

None

2.1.1 EUT Test Setup

- The EUT is mounted and positioned in position or as instructed by manufacturer or the relevant product specification: EUT tested unmounted, representative cabling connected.
- Test equipment: Test wire 1.0 mm



2.1.2 Test Description

- The EUT is not operational during the test
- The access probe is pushed against or inserted through any openings of the enclosure with the force specified in the table below:

Degrees of protection against access to hazardous parts indicated by the first characteristic numeral (protection of persons)		
6	Test wire 1 mm (PEMC 11-005)	1N

- If applicable (not required if it's obvious the access probe is not penetrating at all) for low voltage equipment (<1000VAC/1500VDC) a low voltage supply (40V-50V) in series with a suitable lamp will be connected between the probe and the hazardous parts inside the enclosure:

2.1.3 Pre-Test Control and initial measurements

- Specific observations/conditions: representative cabling connected to EUT

2.1.4 Pre-conditioning

None

2.1.5 Testing





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2.1.6 Pass-Fail criteria

To comply with the conditions of the first characteristic numeral, adequate clearance shall be kept between the access probe and the hazardous parts (as practical definition of hazardous live parts definition 1.2.8.6 of IEC 60950-1 is applied):

- The protection is satisfactory if adequate clearance is kept between the access probe and hazardous parts.

2.1.7 Post-Test Control

- Specific observations/conditions: none

2.1.8 Final measurements

None

2.1.9 Test Result

No hazardous parts can be touched by the test probe. The probe could not enter the unit.

Test Results: PASS

2.2 Degrees of protection provided by enclosures for electrical equipment against solid foreign objects by the first characteristic numeral 6 (protection of equipment) (IP6X)

2.2.1 Referenced Specification

Test Performed according EN 60529:1991 + A1:2000 + A2:2013

6	Dust protected	dust chamber
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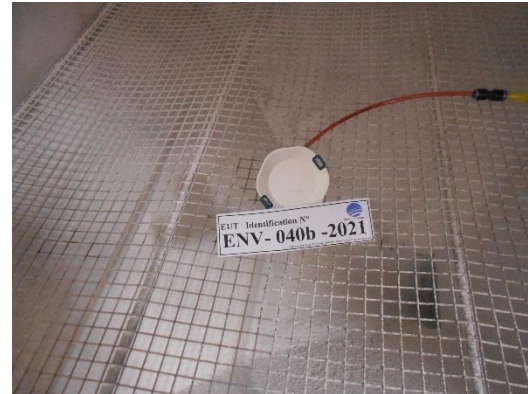
Category 1 (with under pressure) for IP6X

2.2.2 Deviations from Test Procedure

None

2.2.3 EUT Test Setup (performed on sample b)

- The EUT is placed in the dust chamber.
- A small hole (12mm) was made in the housing for the depression connection (by means of a dedicated nipple)
- The EUT is tested non-operational.

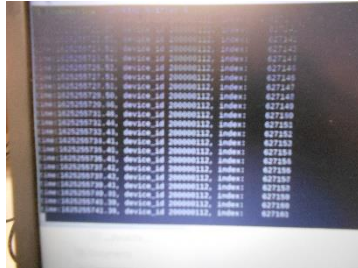


2.2.4 Test Description

- The EUT is not operational during the test
- Parameters for category 1.
- The object of the test is to draw into the enclosure, by means of depression, a volume of air 80 times the volume of the enclosure tested without exceeding the extraction rate of 60 volumes per hour. In no event shall the depression exceed 20 mbar (20 kPa or 0,002MPa).
- The volume of the EUT is approximately diam 45 mm x 10 mm = 15.9 cm³ = 0.016 L (→ 80 * volume = 80 * 0.016 liter = 1.27 liter)
- The maximum extraction rate of 60 volumes/hour = 0.96 liter/hour
- Extraction rate during test: << 1 L/min (not measurable) → test the EUT for 8 hours

2.2.5 Pre-Test Control

- Check if the EUT is operating normally: OK
- Specific observations/conditions: connectors are left "closed"



2.2.6 Testing

- Testing for 8 hours, with cycles of 10 minutes (5 minutes circulation, 5 minutes rest)
- Manometer pressure < 20 mbar



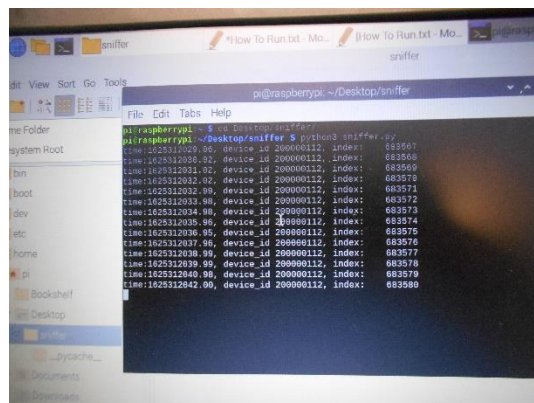
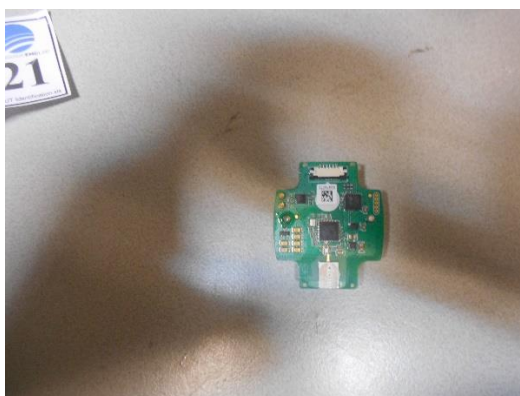
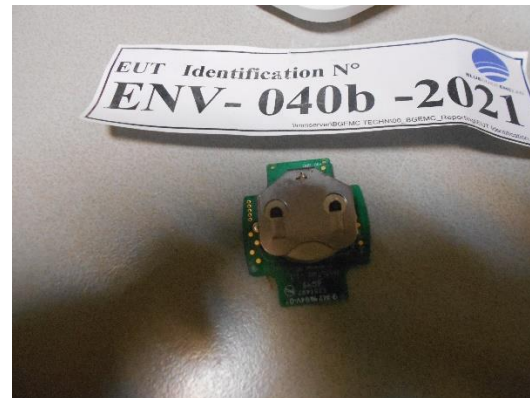
2.2.7 Pass-Fail criteria

The EUT will pass the test when :

- No dust ingress can be seen.

2.2.8 Post-Test Control

The dust on the outside of the EUT was mostly wiped off using a soft cloth.



- Check if the EUT is operating normally: OK
- Specific observations/conditions: none

2.2.9 Test Result

- Check if the EUT is operating normally: OK
- No deposit of dust was found inside the enclosure

Test Results: PASS

2.3 Degrees of protection provided by enclosures for electrical equipment against ingress of water (IPX7 code)

2.3.1 Referenced Specification

Test performed according EN 60529:1991 +A1:2000 +A2:2013, protection against ingress of water

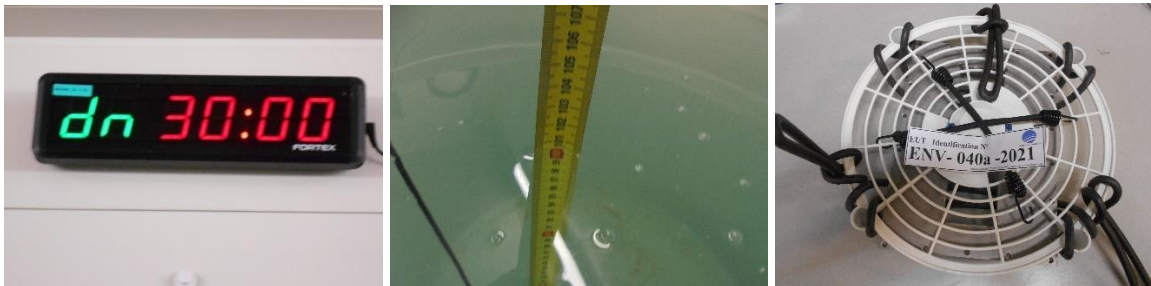
7	Protection against temporary immersion	Water tank
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2.3.2 Deviations from Test Procedure

None

2.3.3 EUT Test Setup (performed on sample a)

- The EUT is mounted in normal position on a plate using straps
- Test equipment: Water tank



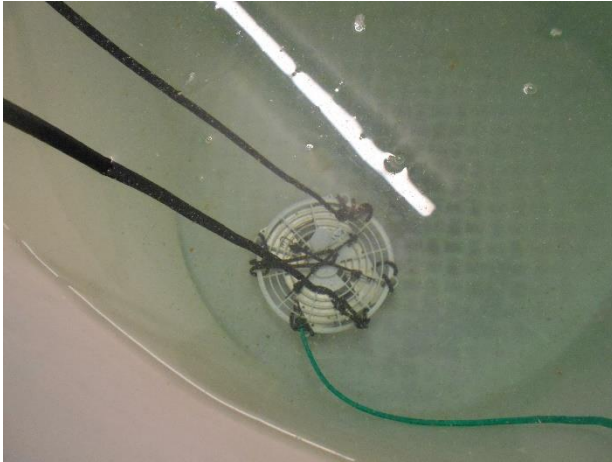
2.3.4 Test Description

- The EUT is not operational during the test
- The lowest point of the EUT was submerged 1m below the water surface.
- Duration of test: 30 min.

2.3.5 Pre-Test Control

- Specific observations/conditions: none

2.3.6 Testing



2.3.7 Pass-Fail criteria

The EUT will PASS the test when :

- No ingress of water observed, or if ingress of water is observed it shall not:
 - be sufficient to interfere with the correct operation of the equipment,
 - deposit on insulation parts,
 - reach live parts or windings not designated to operate when wet,
 - accumulate near the cable end or enter the cable if any

2.3.8 Post-Test Control

After the test, the EUT is evaluated by visual inspection on the outside for water ingress. The EUT is screwed open to check for water ingress.

- Specific observations/conditions: inside is no water is present



- The EUT is mounted in vertical position
- The turntable was rotating as the EUT.
Test equipment: Water jet hose nozzle with flow meter (12,5 mm diameter)



2.4.4 Test Description

- The EUT is not operational during the test
- The EUT was sprayed from all directions
- Water flow rate: 100 liter per minute
- Duration of test: 1min/m², at least 3 min (IPX5/6) -> 3 minutes
- Distance from nozzle to EUT: between 2,5 and 3 meter



2.4.5 Pre-Test Control

- Specific observations/conditions: none

2.4.6 Testing

Atmospheric conditions in test lab for test 2.1, 2.2 and 2.3

Ambient Temperature	:	21.8	°C
Ambient Relative Humidity *	:	77	%RH
Water Temperature	:	21.4	°C





2.4.7 Pass-Fail criteria

The EUT will PASS the test when :

- No ingress of water observed, or if ingress of water is observed it shall not:
 - be sufficient to interfere with the correct operation of the equipment,
 - deposit on insulation parts,
 - reach live parts or windings not designated to operate when wet,
 - accumulate near the cable end or enter the cable if any.

2.4.8 Post-Test Control

After the test, the EUT is evaluated by visual inspection on the outside for water ingress. The EUT is screwed open to check for water ingress.

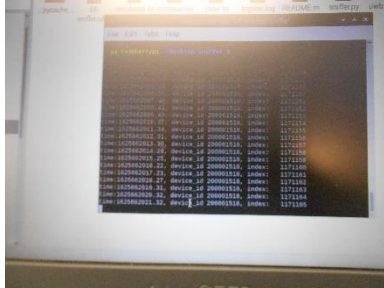
- Specific observations/conditions: inside is no water is present



2.4.9 Test Result

There was no water ingress into the EUT.

The EUT was still seen by the sniffer application.



Test Results: PASS

3. General Conclusion

The EUT passes the IP67 test

4. Test Equipment

4.1 List of test equipment

Equipment	Brand	Model	Serial number	Calibration Due
Test wire 1.0 mm (rigid IEC steel rod with dynamometer 1N) PEMC 11-005	PTL	PTL P10.27	5011557	10 Sep. 2021
Dust chamber BGEMC 01-055	Shenzen Autostrong Instrument Co, Ltd	U13-SS0J08	U13-20140804	NA
Air pressure/flow meter BGEMC 01-084	Testo	512	AF024086/601	03 Aug. 2021
Timer 99 min BGEMC 01-117K	Fortex	FX-TMR-01	N/A	NA
Temperature/humidity meter BGEMC 01-118K	Testo	608-H1	706 0147/0660 6081/45117109	12 Mar. 2022
Water Tank BGEMC 01-043	N/A	1200 L	BGEMC 01-043	NA
Flow meter (19-190l/min) BGEMC 01-064K	Great Plans Industries	TM100	01/064	31 Aug. 2021
Water jet hose noddle IP5/6 (6,3 / 12,5 mm diameter) BGEMC 01-042	Shenzen Autostrong Instrument Co, Ltd	AUTO_IPX5/6	AUTO130902001	NA