

**TEST REPORT****IEC 60529: Edition 2.2, 2013-08****Degrees of protection provided by enclosures (IP Code)**

Report reference No. .... : 1414004STO-001

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Date of issue..... : 19 March 2015

Contents ..... : 24 pages

**Testing laboratory**

Name ..... : Intertek Semko AB

Address ..... : P.O. Box 1103, SE-164 22 Kista, Sweden

Testing location..... : as above

Test date..... : 4 December 2014 – 3 March 2015

**Client**

Name ..... : Infinet Wireless LLC

Address ..... : Office 701, Building 24, S. Deryabinoy Street  
620149 Ekaterinburg, RUSSIA**Test specification**

Standard ..... : IEC 60529: Edition 2.2, 2013-08

Specified IP-code ..... : **IPX7, IP66 and IP67**

TRF date..... : -

**Equipment Under Test (EUT)**

Type of test object ..... : Antenna

Trademark ..... : Infinet Wireless

Model and/or type reference ..... : See general description page 2

Serial No ..... : -

Manufacturer ..... : Infinet Wireless LLC

Rating(s)..... : -

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**2. The base model - InfiLINK XG Xm (antenna 23 dBi, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- InfiLINK Xm/5X.500.2x500.2x23
- InfiLINK Xm/6X.500.2x500.2x24

**3. The base model - InfiLINK XG Xm (antenna 28 dBi, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- InfiLINK Xm/5X.500.2x500.2x28
- InfiLINK Xm/6X.500.2x500.2x27

**4. The base model - InfiLINK XG Um (external antenna, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- InfiLINK Um/5X.500.2x500
- InfiLINK Um/6X.500.2x500

**5. The base model - R5000-Smn (antenna 19 dBi, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- R5000-Smn/5X.300.2x200.2x19
- R5000-Smnt/5X.300.2x200.2x19
- R5000-Smn/6X.300.2x200.2x19
- R5000-Smnt/6X.300.2x200.2x19

**6. The base model - R5000-Smn (antenna 21 dBi, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- R5000-Smn/5X.300.2x200.2x21
- R5000-Smn/5X.300.2x200.2x23
- R5000-Smnt/5X.300.2x200.2x21
- R5000-Smnt/5X.300.2x200.2x23
- R5000-Smn/6X.300.2x200.2x24
- R5000-Smnt/6X.300.2x200.2x24
- R5000-Smnb/5X.300.2x200.2x16
- R5000-Smnb/6X.300.2x200.2x16
- R5000-Smnt/6X.300.2x200.2x16

**7. The base model - R5000-Smn (antenna 28 dBi, 4.9 - 6.425 GHz Band).  
The related equipment modifications are following:**

- R5000-Smn/5X.300.2x200.2x28
- R5000-Smnt/5X.300.2x200.2x28
- R5000-Smn/6X.300.2x200.2x27
- R5000-Smnt/6X.300.2x200.2x27

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**8. The base model - R5000-Lmn (external antenna, 3.4 - 6.425 GHz Band).****The related equipment modifications are following:**

- R5000-Lmn/3X.300.2x200
- R5000-Lmnt/3X.300.2x200
- R5000-Lmn/5X.300.2x200
- R5000-Lmnt/5X.300.2x200
- R5000-Lmn/6X.300.2x200
- R5000-Lmnt/6X.300.2x200

**9. The base model - AUX-ODU- LPU-G.****The related equipment modifications are following:**

- AUX-ODU-LPU-G
- AUX-ODU-ING-G

IEC 60529: Edition 2.2, 2013-08

<b>10</b>	<b>Marking.</b>		
	Marking		N/A
<b>11</b>	<b>General requirement for tests.</b>		
<b>11.1</b>	Tests should be carried out under the standard atmospheric conditions described in IEC 68-1		P
<b>11.2</b>	Test samples shall be in a clean and new condition.		P
	The relevant product standard shall specify details such as: The number of samples to be tested;		N/A
	-conditions for mounting, assembling and positioning of the samples;		P
	-the pre-conditioning, if any, which is to be used;		N/A
	-whether to be tested energized or not;		N/A
	-whether to be tested with its parts in motion or not;		N/A
<b>11.5</b>	<b>Empty enclosures</b>		
	If the enclosure is tested without equipment inside, the manufacturer shall ensure that after the electrical equipment is enclosed the enclosure meets the declared degree of protection of the final product.		N/A
<b>12</b>	<b>Tests for protection against access to hazardous parts indicated by the first characteristic numeral.</b>		-
	Test conditions for IP 0X:	No test required	N/A
	Test conditions for IP 1X: The sphere of 50 mm $\varnothing$		N/A
	Test conditions for IP 2X: The jointed test finger may penetrate up to its 80 mm length, but adequate clearance shall be kept.		N/A
	Test conditions for IP 3X: The test rod of 2,5 mm $\varnothing$ shall not penetrate and adequate clearance shall be kept.		N/A
	Test conditions for IP 4X: The test wire of 1,0 mm $\varnothing$ shall not penetrate and adequate clearance shall be kept.		N/A
	Test conditions for IP 5X: Same as above.		N/A
	Test conditions for IP 6X: Same as above.	The test wire ( $\varnothing$ 1 mm) did not penetrate the enclosure and adequate clearance was kept.	P

13 Tests for protection against solid foreign objects indicated by the first characteristic numeral.					
First, characteristic numeral.	Test means (object probes and dust chamber)	Test force	Test conditions, see		N/A
0	No test required	-	-		N/A
1	Rigid sphere without handle or guard 50 <sub>0</sub> <sup>+0,05</sup> mm diameter.	50 N ± 10%	13.2		N/A
2	Rigid sphere without or guard 12,5 <sub>0</sub> <sup>+0,2</sup> mm diameter.	30 N ± 10%	13.2		N/A
3	Rigid steel rod 2,5 <sub>0</sub> <sup>+0,05</sup> mm diameter with edges free from burrs	3 N ± 10%	13.2		N/A
4	Rigid steel wire 1,0 <sub>0</sub> <sup>+0,05</sup> mm diameter with edges free from burrs.	1N ± 10%	13.2		N/A
5	Dust chamber, with or without underpressure	-	13.4+13.5		N/A
6	Dust chamber, with underpressure	-	13.4+13.6	Dust chamber 8 hours with underpressure 20mBar	P
13.6.2	Acceptance conditions for the first characteristic numeral 6. The protection is satisfactory if no deposit of dust is observable inside the enclosure at the end of the test.			No ingress of dust inside the Enclosure.	P

IEC 60529: Edition 2.2, 2013-08

<b>14</b>	<b>Tests for protection against water indicated by the second characteristic numeral.</b>		
14.2.0	No test required	IPX0	N/A
14.2.1	Test for second characteristic numeral 1 with a drip box.		N/A
14.2.2	Test for second characteristic numeral 2 with a drip box.		N/A
14.2.3	Test for second characteristic numeral 3 with an oscillating tube or spray nozzle.		N/A
14.2.4	Test for second characteristic numeral 4 with oscillating tube or spray nozzle.		N/A
14.2.5	Test for second characteristic numeral 5 with a 6.3-mm nozzle, tested with a spraying nozzle.		N/A
14.2.6	Test for second characteristic numeral 6 with a 12.5-mm nozzle	Nozzle 12.5 mm Duration 3 min Flow 100 l/min Distance 2.5 – 3 m	P
14.2.7	Test for second characteristic numeral 7:	Immersion tank Depth 1 m Duration 30 min	P
14.2.8	Test for second characteristic numeral 8: Continuous immersion subject to agreement.		N/A
14.2.9	Test for second characteristic numeral 9 by high pressure and temperature water jetting.		N/A
14.3	Acceptance conditions for <b>IPX6 and IPX7</b> : The protection is satisfactory if any water has entered, it shall not be sufficient to interfere the correct operation or impair the safety of the equipment.	No trace of water inside the enclosure	P
15.	Tests for protection against access to parts indicated by the additional letter.		N/A

**SUMMARY OF ENCAPSULATION TESTS ACCORDING TO IEC 60 529: 2013**

**Conclusion of the IP66 and IP67 test:** PASS

The result of the test was in compliance with the requirements in the standard IEC 60 529 Ed 2.2: (2013)



**Picture 1:** EUT type R5000-Mmx. Antenna 23 dBi, 3.4-6.425 GHz Band



**Picture 2:** EUT type R5000-Mmx. Antenna 23 dBi, 3.4-6.425 GHz Band



**Picture 3:** EUT type InfiLINK XG Xm. Antenna 23 dBi, 4.9-6.425 GHz Band

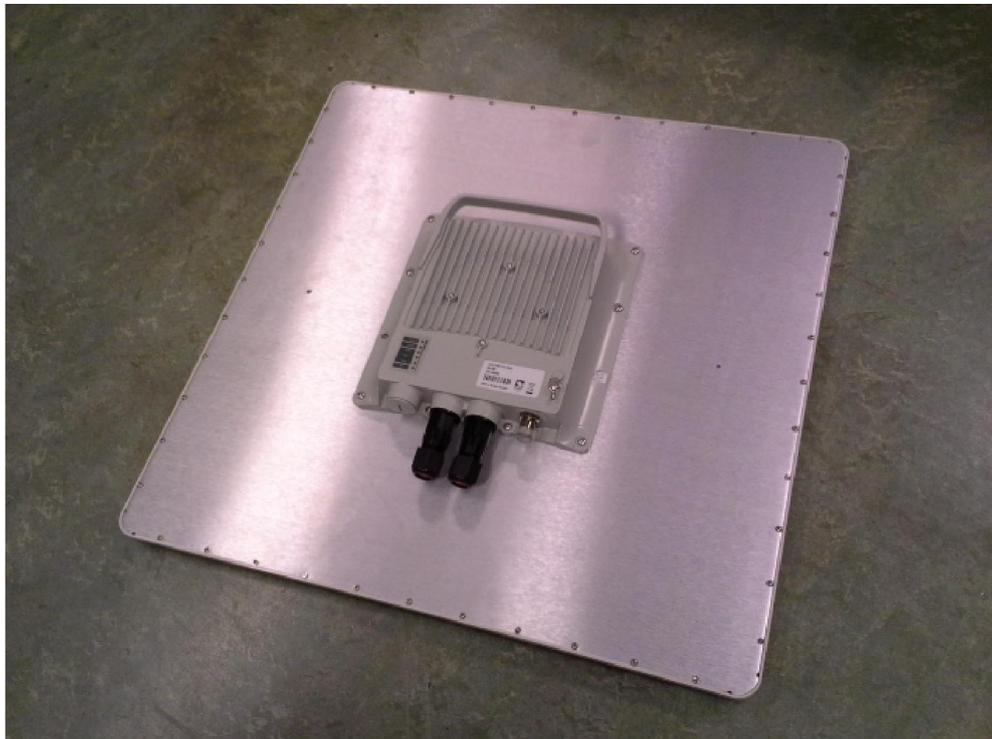


**Picture 4:** EUT type InfiLINK XG Xm. Antenna 23 dBi, 4.9-6.425 GHz Band

IEC 60529: Edition 2.2, 2013-08



**Picture 5:** EUT type InfiLINK XG Xm. Antenna 28 dBi, 4.9-6.425 GHz Band



**Picture 6:** EUT type InfiLINK XG Xm. Antenna 28 dBi, 4.9-6.425 GHz Band

IEC 60529: Edition 2.2, 2013-08



**Picture 7:** EUT type InfiLINK XG Um. External antenna 28 dBi, 4.9-6.425 GHz Band



**Picture 8:** EUT type InfiLINK XG Um. External antenna 28 dBi, 4.9-6.425 GHz Band



**Picture 9:** EUT R5000-Smn. Antenna 19 dBi, 4.9-6.425 GHz Band



**Picture 10:** EUT R5000-Smn. Antenna 19 dBi, 4.9-6.425 GHz Band



**Picture 11:** EUT R5000-Smn. Antenna 21 dBi, 4.9-6.425 GHz Band



**Picture 12:** EUT R5000-Smn. Antenna 21 dBi, 4.9-6.425 GHz Band

IEC 60529: Edition 2.2, 2013-08



**Picture 13:** EUT R5000-Smn. Antenna 28 dBi, 4.9-6.425 GHz Band



**Picture 14:** EUT R5000-Smn. Antenna 28 dBi, 4.9-6.425 GHz Band

IEC 60529: Edition 2.2, 2013-08



**Picture 15:** EUT R5000-Lmn. External antenna, 3.4-6.425 GHz Band



**Picture 16:** EUT R5000-Lmn. External antenna, 3.4-6.425 GHz

IEC 60529: Edition 2.2, 2013-08



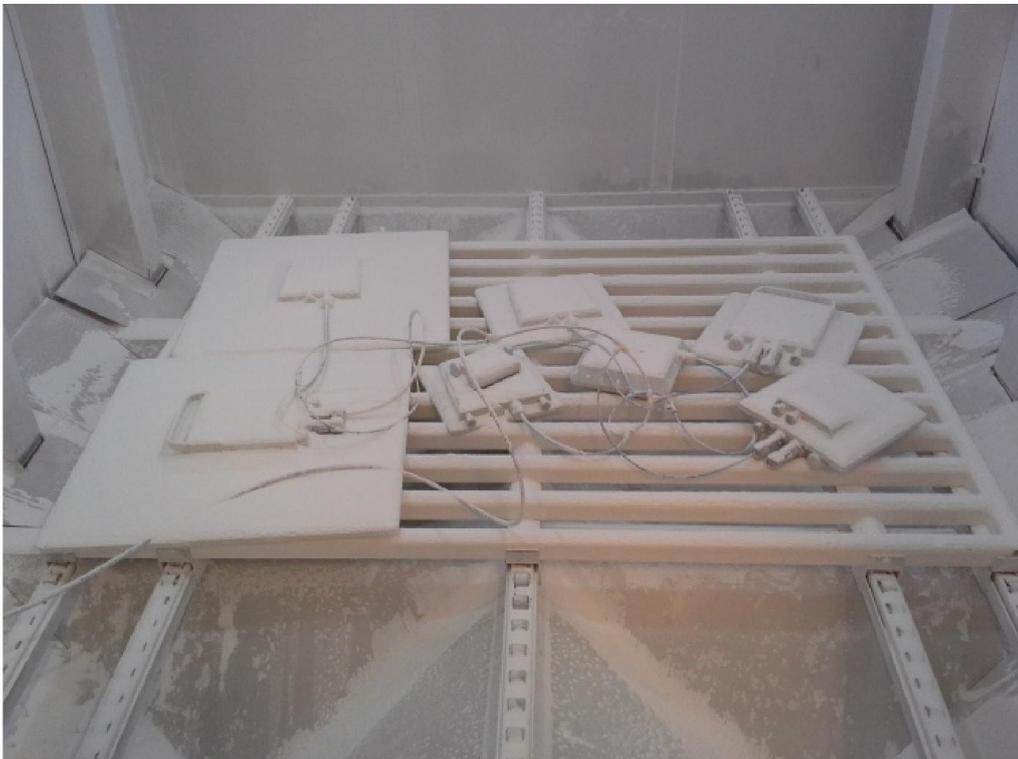
**Picture 17: AUX-ODU-LPU-G**



**Picture 18: AUX-ODU-LPU-G**



**Picture 19:** EUTs before IP6X test (Dust with underpressure)

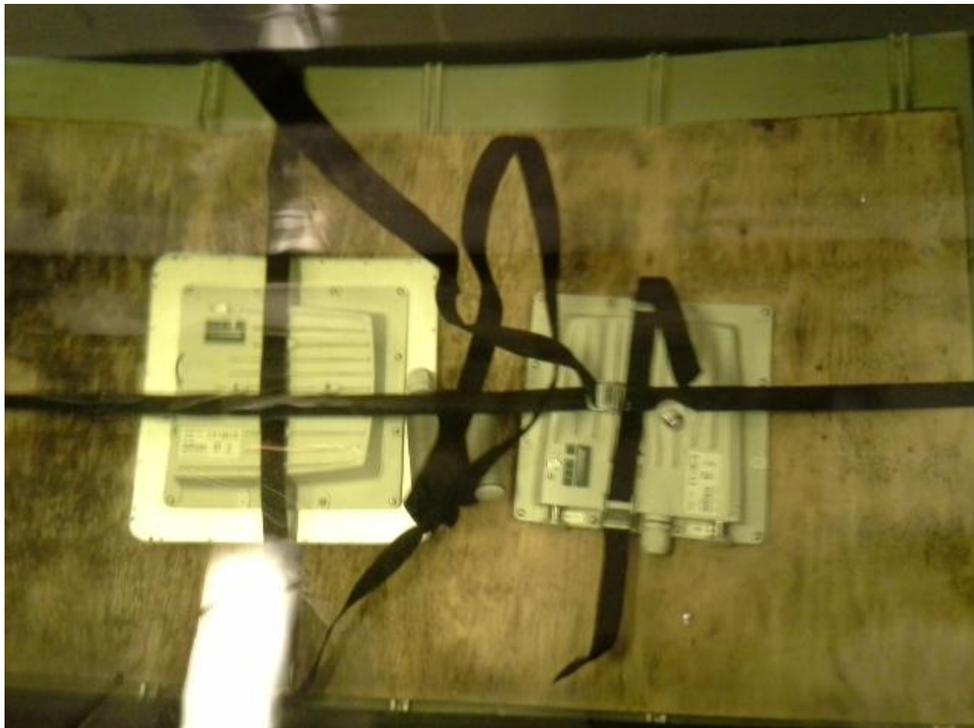


**Picture 20:** EUTs after IP6X test (Dust with underpressure)

IEC 60529: Edition 2.2, 2013-08

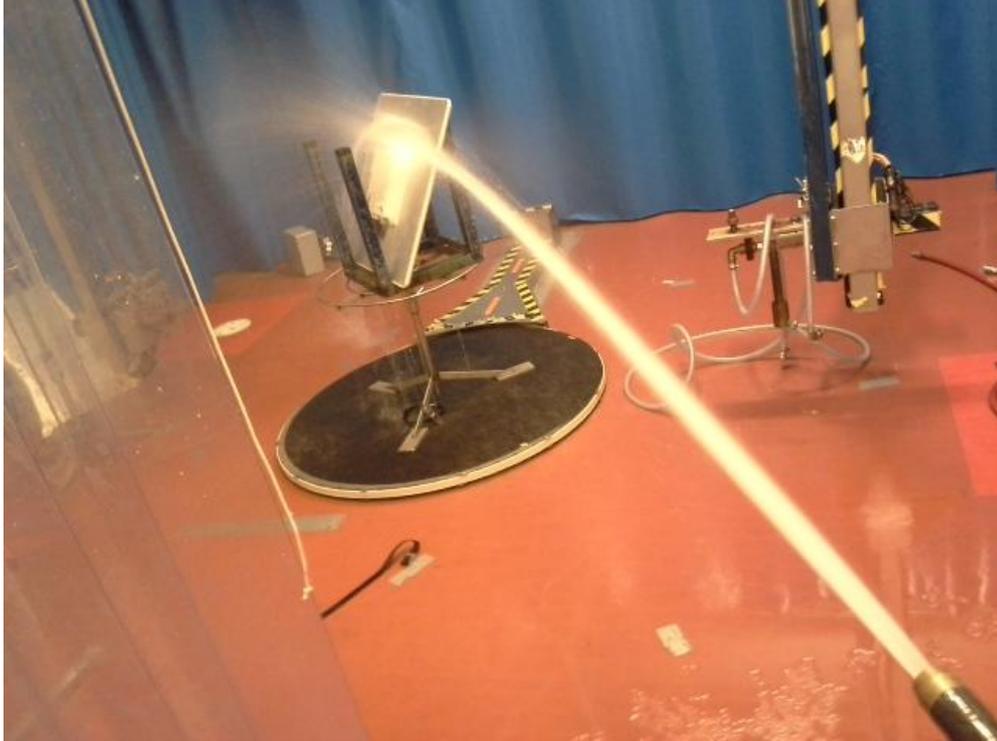


**Picture 21:** Immersion tank



**Picture 22:** Example of two EUTs in the immersion tank IPX7 test

IEC 60529: Edition 2.2, 2013-08



Picture 23: Example of EUT during IPX6 test



Picture 24: EUT type R5000-Mmx. Antenna 23 dBi, 3.4-6.425 GHz Band. No trace of water inside the enclosure after the IPX7 test

IEC 60529: Edition 2.2, 2013-08



**Picture 25:** EUT type R5000-Mmx. Antenna 23 dBi, 3.4-6.425 GHz Band.  
No trace of water inside the enclosure after the IPX7 test.



**Picture 26:** EUT type InfiLINK XG Xm. Antenna 23 dBi, 4.9-6.425 GHz Band.  
No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.

IEC 60529: Edition 2.2, 2013-08

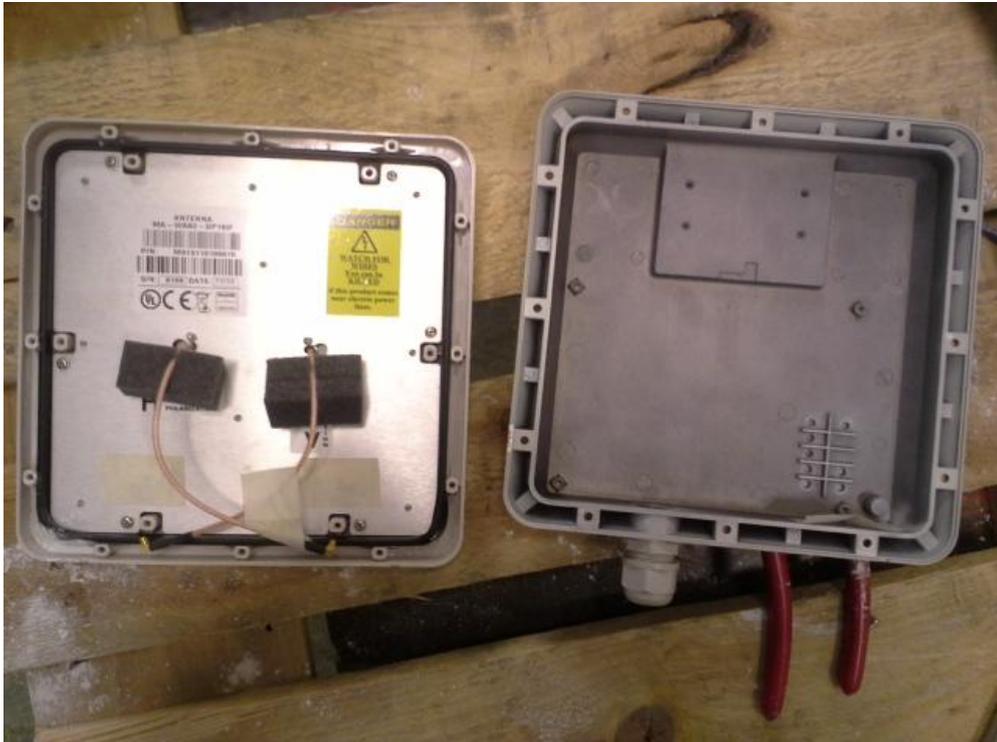


**Picture 27:** EUT type InfiLINK XG Xm. Antenna 28 dBi, 4.9-6.425 GHz Band. No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.



**Picture 28:** EUT type InfiLINK UG Xm. External antenna. 4.9-6.425 GHz Band. No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.

IEC 60529: Edition 2.2, 2013-08



**Picture 29:** EUT R5000-Smn. Antenna 19 dBi, 4.9-6.425 GHz Band.  
No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.



**Picture 30:** EUT R5000-Smn. Antenna 21 dBi, 4.9-6.425 GHz Band.  
No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.

IEC 60529: Edition 2.2, 2013-08

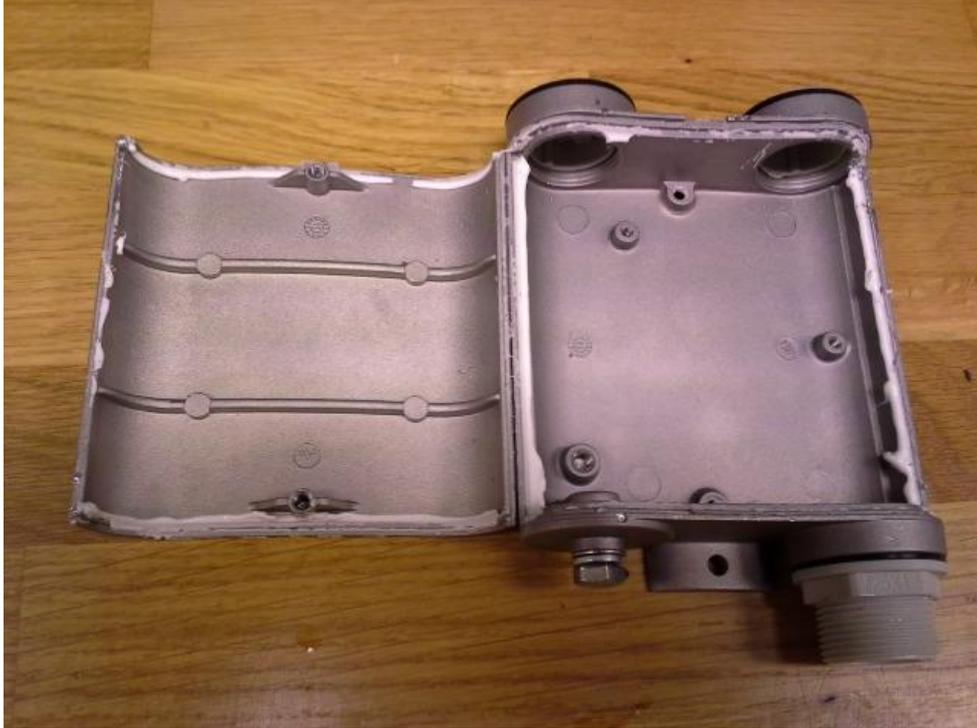


**Picture 31:** EUT R5000-Smn. Antenna 28 dBi, 4.9-6.425 GHz Band.  
No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.



**Picture 32:** EUT R5000-Lmn. External antenna, 3.4-6.425 GHz Band.  
No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.

IEC 60529: Edition 2.2, 2013-08



**Picture 33:** EUT AUX-ODU-LPU-G

No trace of water or dust inside the enclosure after the IP6X, IPX6 and IPX7 tests.