Report for Test of Conformance to LoRaWAN™ V1.0.2

for the Device

“Watersens"

for the Customer

“IOT Aonchip SL”

Dietmar Krebs
Yavuz Turan

2nd March, 2020
Administrative Summary

Location: IMST GmbH, Test Centre, Kamp-Lintfort, Germany

Responsible Test Engineer: Yavuz Turan, Dietmar Krebs

Subject: Test of Conformance to LoRaWAN™ Specification V1.0.2

Company and Contact Information:
IOT Aonchip SL
José Fernández Real
C/ Cementiri Vell, 12 11
0822 Terrassa
Spain

Tested Device: Watersens

Firmware version: 0.10.07
Hardware version: 01.03.00
End-device identifier: 54303030343f41

LoRa Device Class: A
LoRaWAN Specification version: V1.0.2

Certification requirements: LoRa End Device Certification EU Version 1.5
Frequency band(s) tested: 868 MHz

Test Equipment: LoRaWAN™ Gateway software version 5.0.1
Packet forwarder software version 4.0.1

Test Result: PASS

Chief Test Engineer: Dietmar Krebs
Dept. Test Center

Date: March 2nd, 2020

The Test Report, No. 6200186 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Yavuz Turan
Approved: Dietmar Krebs

Yavuz Turan
Test Engineer

Dietmar Krebs
Quality Engineer
1 Description of the Device Under Test (DUT)

1.1 General

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>Watersens</td>
</tr>
<tr>
<td>Kind of product</td>
<td>Smart water control</td>
</tr>
<tr>
<td>Series (if any)</td>
<td></td>
</tr>
<tr>
<td>Hardware Version</td>
<td>01.03.00</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>0.10.07</td>
</tr>
<tr>
<td>Type of DUT</td>
<td>☒ Module / End Device ☐ Gateway / Concentrator</td>
</tr>
<tr>
<td>Geographical area of operation</td>
<td>☒ Europe ☐ USA</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>☒ 433 MHz ☐ 868 MHz ☒ 915 MHz</td>
</tr>
<tr>
<td>Adaptive Data Rate (ADR) supported?</td>
<td>☒ Yes ☐ No</td>
</tr>
<tr>
<td>Optional data rates supported?</td>
<td>☒ DR6 ☒ DR7</td>
</tr>
<tr>
<td>Activation possibilities</td>
<td>☒ Over the air ☐ by personalization ☒ both</td>
</tr>
<tr>
<td>Test According LoRaWAN™ Spec</td>
<td>☒ V1.0.1 ☒ V1.0.2</td>
</tr>
<tr>
<td>Output Power</td>
<td>Up to +14dBm</td>
</tr>
<tr>
<td>Number / Type of Antenna(s)</td>
<td>1</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>2dBi</td>
</tr>
</tbody>
</table>

Table 1 Device Information

1.2 DUT Modes of Operation

During the tests the device operated in the following modes:
- Test mode according to document “LoRa End Device Certification EU V1_5” Chapter 3.

1.3 DUT Setup

Figure 1 DUT Setup
Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN™ specification V1.0.2

Detailed Test Results:

Device Activation (Activation by Personalization): **PASS**
Test Mode Activation (Over the Air Activation): **PASS**
Test Application Functionality: **PASS**
Packet Error Rate RX2 SF12: **PASS**
Cryptography: **PASS**
Downlink Window Timing: **PASS**
Frame Sequence Number: **PASS**
Device Status Request: **PASS**
Mac Commands: **PASS**
New Channel Request: **PASS**
Di Channel Request Mac Command: **PASS**
Confirmed Packets: **PASS**
RX Parameter Setup Request: **PASS**
RX Timing Setup Request: **PASS**
Link ADR Request: **PASS**
Packet Error Rate RX1 Window: **PASS**
Packet Error Rate RX2 Window: **PASS**

Supported Optional Features:

Adaptive Data Rate (ADR): **Yes**
DR6 (SF7BW250): **Yes**
DR7 (FSK50): **Yes**
Link ADR Request Block: **Yes**
Di Channel Request: **Yes**
Range 6dB: **Yes**

Remarks: None.

Result: The device passed the test without limitations.