



The Testcenter facility 'LoRa® Test Lab' within IMST GmbH is recognized by the LoRa™ Alliance for testing in accordance to the LoRaWAN™ Specification V1.0.2

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# Report for Test of Conformance to LoRaWAN™ V1.0.2

for the Device

“Watersens”

for the Customer

“IOT Aonchip SL”

Dietmar Krebs

Yavuz Turan

2<sup>th</sup> 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

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Tested Device: Watersens

Firmware version: 0.10.07

Hardware version: 01.03.00

End-device identifier: 5430303030434f41

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: Test Software Version: 1.1.11

IMST LGW (iC880A + Raspberry Pi): 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 2<sup>th</sup>, 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 Dietmar Krebs  
Test Engineer Quality Engineer

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# 1 Description of the Device Under Test (DUT)

## 1.1 General

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

**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.**