



The Testcenter facility 'LoRa<sup>®</sup> Test Lab' within IMST GmbH is recognized by the LoRa<sup>®</sup> Alliance for testing in accordance to the LoRaWAN<sup>®</sup> Specification V1.0.4

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# Report for Test of Conformance to LoRaWAN<sup>®</sup> V1.0.4 Class A (EU868)

for the Device

**“flowIQ<sup>®</sup> 2200”**

for the Customer

**“IMST GmbH”**

Jens Lerner

Yavuz Turan

31<sup>th</sup> August, 2022

## Administrative Summary

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

Responsible Test Engineer: Yavuz Turan, Jens Lerner

Subject: Test of Conformance to LoRaWAN® Specification V1.0.4 (Class A for EU868)

Company and Contact Information:

Kamstrup A/S

Aron Stefánsson

Industrivej 28

8660 Skanderborg

Denmark

Tested Device: flowIQ® 2200

Hardware version: 5550 1911

Firmware version: D8

End-device identifier: 23826430

LoRa Device Class: A

LoRaWAN Specification version: V1.0.4

Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirements V1.4

Frequency band(s) tested: 868MHz

Test Equipment: LCTT v3.7.0\_R1

2x IMST LGW (iC880A + Raspberry Pi): Gateway software version 5.0.1

Packet forwarder software version 4.0.1


Test Result: PASS


Quality Engineer: Jens Lerner

Date: August 31<sup>th</sup>, 2022

The Test Report, No. 6220415 has the following conclusion:

**The device has PASSED the tests hereunder.**

Responsibility:   
Yavuz Turan  
Test Engineer

Approved:   
Jens Lerner  
Quality Engineer

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# 1 Description of the Device Under Test (DUT)

## 1.1 General

Item	Value
Product name	flowIQ@ 2200
Product Vertical(s)	Utilities
Series (if any)	N/A
Hardware Version	5590 1911
Firmware Version	D8
Type of DUT	<input type="checkbox"/> Module <input checked="" type="checkbox"/> End Device/Sensor <input type="checkbox"/> others
Geographical area of operation	<input checked="" type="checkbox"/> Europe <input type="checkbox"/> USA <input type="checkbox"/> Australia
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 checked="" type="checkbox"/> Over the air <input type="checkbox"/> by personalization <input type="checkbox"/> both
Test According LoRaWAN® Spec	<input type="checkbox"/> V1.0.1 <input type="checkbox"/> V1.0.2 <input checked="" type="checkbox"/> V1.0.4
Output Power	+13.6 to -0.4
Number / Type of Antenna(s)	1/Internal
Antenna Gain	-2.32 dBi

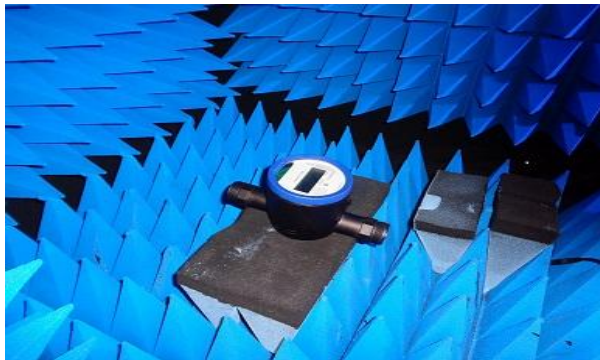
**Table 1 Device Information**

## 1.2 DUT Modes of Operation

During the tests the device operated in the following modes:

- Test mode according to document “LoRa Alliance End Device Certification Requirements for All Regions Version 1.4” Chapter 2.

## 1.3 DUT Setup



**Figure 1 DUT Setup**

Applied Methods of Measurement

## 1.4 Protocol Testing according to LoRaWAN® specification V1.0.4 (Class A device for EU868)

### Detailed Test Results:

Test Mode Activation: **PASS**  
Over the Air Activation: **PASS**  
Cryptography: **PASS**  
Downlink Sequence Number: **PASS**  
Confirmed Frames: **PASS**  
Device Status Request: **PASS**  
New Channel Request: **PASS**  
Di Channel Request Mac Command: **PASS**  
RX Parameter Setup Request: **PASS**  
RX Timing Setup Request: **PASS**  
TX Parameter Setup Request: **PASS**  
Link Check Request: **PASS**  
Link ADR Request: **PASS**  
Duty Cycle Request: **PASS**  
Device Time Request: **PASS**  
RX1 Window Test: **PASS**  
RX2 Window Test: **PASS**  
RX1 and RX2 Simultaneous Frames: **PASS**  
RX Oversized Payload: **PASS**  
Maximum Allowed Payload: **PASS**  
Mac Commands: **PASS**  
Multiple MAC Commands Prioritization: **PASS**  
Device Deactivation: **PASS**

### Supported Optional Features:

Adaptive Data Rate (ADR):	Yes
SF7BW250 (DR6)	Yes
FSK50 (DR7)	Yes
Permanent Class C	No

Remarks: None

**Result: The device passed the test without limitations.**