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

# Report for Test of Conformance to LoRaWAN™ V1.0.4 Class C

## for the Device

## "iM881A-XL"

## for the Customer

## "IMST GmbH"

Jens Lerner

Yavuz Turan

5th July, 2021

# 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 C for EU)

Company and Contact Information:
IMST GmbH
Heinz Syrzisko
Carl-Friedrich-Gauss-Str. 2-4
47475 Kamp-Lintfort
Germany
Tested Device: iM881A-XL
Hardware version: A
Firmware version: V3.0
End-device identifier: 70B3D58FFFFFFFFF
LoRa Device Class: C
LoRaWAN Specification version: V1.0.4
Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirement V1.1
Frequency band(s) tested: 868MHz
Test Equipment: Test Software Version: 1.2
8x IMST LGW (iC980A + Raspberry Pi): Gateway software version 4.1.3
Packet forwarder software version 3.1.0

Test Result: PASS

Quality Engineer:      Jens Lerner

Date:      July 5$^{th}$, 2021

The Test Report, No. 6210238 has the following conclusion:

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

Responsibility:      Approved:

Yavuz Turan           Jens Lerner
Test Engineer          Quality Engineer

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# 1 Description of the Device Under Test (DUT)

## 1.1 General

| Item | Value |
|---|---|
| Product name | iM881A-XL |
| Product Vertical(s) | |
| Series (if any) | |
| Hardware Version | A |
| Firmware Version | V3.0 |
| Type of DUT | ☒ Module ☐ End Device/Sensor ☐ others |
| Geographical area of operation | ☒ Europe ☐ USA ☐ Australia |
| Operating frequency | ☐ 433 MHz<br>☒ 868 MHz<br>☐ 915 MHz |
| Adaptive Data Rate (ADR) supported? | ☒ Yes ☐ No |
| Optional data rates supported? | ☒ DR6 ☒ DR7 |
| Activation possibilities | ☒ Over the air ☐ by personalization ☐ both |
| Test According LoRaWAN™ Spec | ☐ V1.0.1 ☐ V1.0.2 ☒ V1.0.4 |
| Output Power | max. 17.5dBm |
| Number / Type of Antenna(s) | |
| Antenna Gain | |

**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 1.1" Chapter 2.
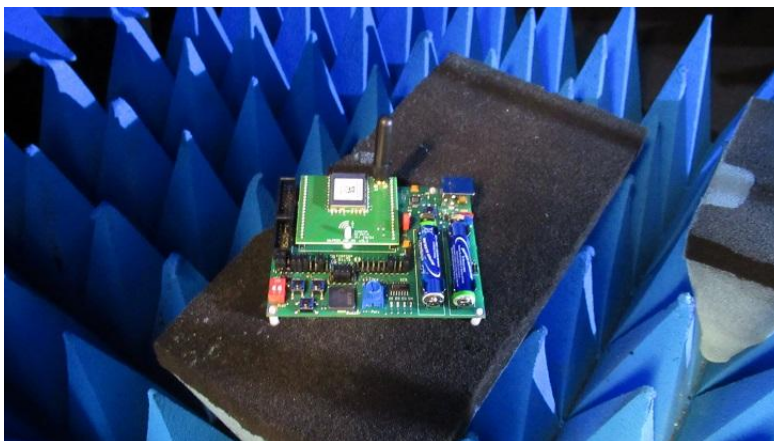
## 1.3 DUT Setup



**Figure 1 DUT Setup**

Applied Methods of Measurement
## 1.4 Protocol Testing according to LoRaWAN™ specification V1.0.4 (Class C device for EU868)

Detailed Test Results Class A:
Device Activation (Activation by Personalization): **PASS**
Test Mode Activation (Over the Air Activation): **PASS**
Cryptography: **PASS**
Frame Sequence Number: **PASS**
Confirmed Packets: **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**
Uplink Datarate RX1 DR Offset Mapping: **PASS**
Packet Error Rate Rx1 MaxSize: **PASS**
Packet Error Rate Rx1 MaxSize: **PASS**
RX1 And RX2 Simultaneous Frames: **PASS**
RX Oversized Payload: **PASS**
Maximum Allowed Payload: **PASS**
Mac Commands: **PASS**
Mac Commands Buffer: **PASS**
Device Deactivation: **PASS**

Detailed Test Results Class C:
Test Mode Activation (Over the Air Activation): **PASS**
RXC Reception Part 1: **PASS**
RXC Reception Part 2: **PASS**
RXC Packet Error Rate: **PASS**
RXC Confirmed Uplinks: **PASS**
Over The Air Activation**: PASS**
Switch Class A: **PASS**
Device Deactivation: **PASS**

Supported Optional Features:
| | |
|---|---|
| Adaptive Data Rate (ADR): | Yes |
| Min TX Power: | Yes |
| SF7BW250 (DR6) | Yes |
| FSK50 (DR7) | Yes |
| Permanent Class C | Yes |

Remarks: None

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