



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 V1.0.2

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# Report for Test of Conformance to LoRaWAN<sup>™</sup> V1.0.2

for the Device

**"iM980A"**

for the Customer

**"IMST GmbH"**

Markus Ridder

Jens Lerner

February, 22<sup>nd</sup> 2018

## Administrative Summary

Location: IMST GmbH, Test Centre, Jens Lerner, Markus Ridder

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

Company and Contact Information:

IMST GmbH

Heinz Syrzisko

Carl-Friedrich-Gauss-Str. 2-4

D-47475 Kamp-Lintfort

Germany

Tested Device: iM980A

Firmware version: 2.0

Hardware version: B1

End-device identifier: 212232425262728

LoRa Device Class: A

LoRaWAN Specification version: V1.0.2

Certification requirements: LoRa End Device Certification US Version 1.3

Frequency band(s) tested: 915 MHz

Test Equipment: Test Software Version: 1.1.12

8 IMST LGW (iC980A + Raspberry Pi): Gateway software version 4.1.3

Packet forwarder software version 3.1.0

Test Result: PASS

Chief Test Engineer: Markus Ridder  
Dept. Test Centre

Date: February, 22<sup>nd</sup> 2018

The Test Report, No. 61840220 has the following conclusion:

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

Responsibility:



Jens Lerner  
Test Engineer

Approved:



Markus Ridder  
Quality Engineer

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# 1 Description of the Device Under Test (DUT)

## 1.1 General

Item	Value
Product name	iM980A
Kind of product	Radio Module
Series (if any)	Starter Kit
Hardware Version	B1
Firmware Version	2.0
Type of DUT	<input checked="" type="checkbox"/> Module / End Device <input type="checkbox"/> Gateway / Concentrator
Geographical area of operation	<input type="checkbox"/> Europe <input checked="" type="checkbox"/> USA
Operating frequency	<input type="checkbox"/> 433 MHz <input type="checkbox"/> 868 MHz <input checked="" type="checkbox"/> 915 MHz
Adaptive Data Rate (ADR) supported?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Optional data rates supported?	<input type="checkbox"/> DR6 <input 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 <input type="checkbox"/> V1.0.1 <input checked="" type="checkbox"/> V1.0.2
Output Power	max 17.5 dBm
Number / Type of Antenna(s)	1 Dipole Antenna
Antenna Gain	

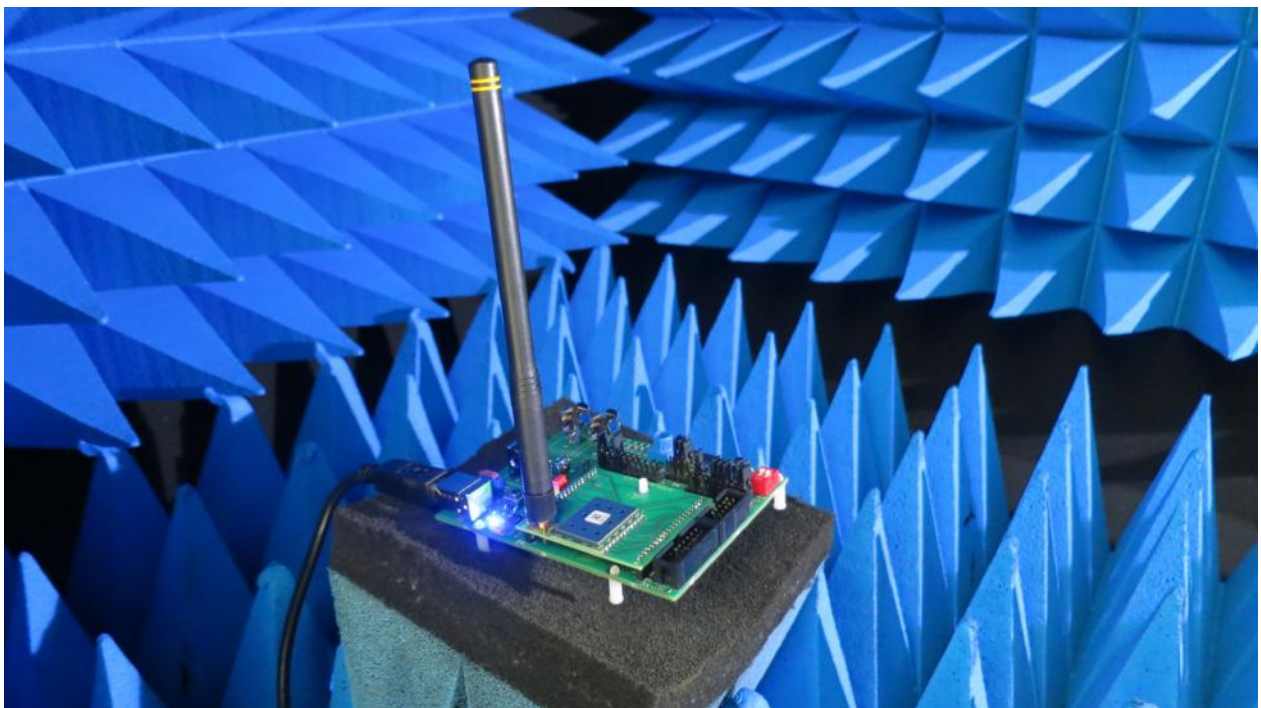
**Table 1 Device Information**

## 1.2 DUT Modes of Operation

During the tests the device operated in the following modes:

- Test mode according to document “LoRa End Device Certification US V1\_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 (ABP): **PASS**  
Test Application Functionality: **PASS**  
Over The Air Activation: **PASS**  
Channel Plan Usage: **PASS**  
Packet Error Rate RX2 Default: **PASS**  
Cryptography: **PASS**  
Downlink Window Timing: **PASS**  
Frame Sequence Number: **PASS**  
Device Status Request: **PASS**  
New Channel Request: **PASS**  
Confirmed packets: **PASS**  
RX Parameter Setup Request: **PASS**  
RX Timing Setup Request: **PASS**  
Link ADR Request: **PASS**  
Maximum Allowed Payload: **PASS**  
Rx Oversized Payload: **PASS**  
Mac Commands: **PASS**  
Uplink Data Rate Rx1Droffset Mapping: **PASS**  
Packet Error Rate RX1 Window: **PASS**  
Packet Error Rate RX2 Window: **PASS**

### Supported Optional Features:

Adaptive Data Rate (ADR): Yes  
LinkADRReq Block Processing: Yes  
Frame Counter Size: 32 bits  
Max. Retransmission for Confirmed Uplinks: 7

Remarks: None

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