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.

Report for Test of Conformance to LoRaWAN™ V1.0.2

for the Device

“iM880B-L"

for the Customer

“IMST GmbH”

Markus Ridder
Yavuz Turan

December, 21st 2018
Administrative Summary

Location: IMST GmbH, Test Centre, Yavuz Turan, 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: iM880B-L
Firmware version: 2.0
Hardware version: B
End-device identifier: 0000000000000000
LoRa Device Class: A
LoRaWAN Specification version: V1.0.2
Certification requirements: LoRa End Device Certification India Version 1.1
Frequency band(s) tested: 865 MHz
Test Equipment: Test Software Version: 1.1.1
Semtech IOT SX1301 Starter Kit: Gateway software version 3.1.0
Packet forwarder software version 2.1.0

Test Result: PASS

Chief Test Engineer: Markus Ridder
Dept. Test Centre

Date: December, 21th 2018

The Test Report, No. 6181674 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

<table>
<thead>
<tr>
<th>Item</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product name</td>
<td>iM880B-L</td>
</tr>
<tr>
<td>Kind of product</td>
<td>Radio Module</td>
</tr>
<tr>
<td>Series (if any)</td>
<td>B</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>B</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>V2.0</td>
</tr>
<tr>
<td>Type of DUT</td>
<td>Module / End Device</td>
</tr>
<tr>
<td>Geographical area of operation</td>
<td>Europe</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>865 MHz</td>
</tr>
<tr>
<td>Adaptive Data Rate (ADR) supported?</td>
<td>Yes</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, V1.0.1, V1.0.2</td>
</tr>
<tr>
<td>Output Power</td>
<td>max. 19dBm</td>
</tr>
<tr>
<td>Number / Type of Antenna(s)</td>
<td>50 Ohm port/external antenna of SK-iM880A</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td></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 IN V1_1”.

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**
Di 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 max Size: **PASS**
Packet Error Rate RX2 Window max Size: **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
Frame Counter Size: 32 bits: Yes
Max. Retransmission for Confirmed Uplinks: 7

Remarks: None

Result: The device passed the test without limitations.