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 for the Device “LST module” for the Customer “Shenzhen Dragino Technology Development co. LTD”

Jens Lerner
Yavuz Turan

21st June, 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

Company and Contact Information:
Shenzhen Dragino Technology Development co. LTD
Edwin Chen
No.8 CaiYunRoad, LongCheng Street, LongGang District
518116, Shenzhen
China
Tested Device: LST module
Hardware version: V1.1
Firmware version: LSN50 v1.8.0
End-device identifier: 0x0182f2f6
LoRa Device Class: A
LoRaWAN Specification version: V1.0.4
Certification requirements: LoRa End Device Certification Requirements Version 1.1
Frequency band(s) tested: 868 MHz
Test Equipment: Test Software Version: 1.2
  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: June 21st, 2021

The Test Report, No. 6210412 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Yavuz Turan
Approved: Jens Lerner
Test Engineer 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>LST module</td>
</tr>
<tr>
<td>Product Version</td>
<td>LST v1.1</td>
</tr>
<tr>
<td>Series (if any)</td>
<td>N/A</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>V1.1</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>LSN50 v1.8.0</td>
</tr>
<tr>
<td>Type of DUT</td>
<td>☒ Module ☐ End Device/Sensor ☐ others</td>
</tr>
<tr>
<td>Geographical area of operation</td>
<td>☒ Europe ☐ USA</td>
</tr>
<tr>
<td>Operating frequency</td>
<td>☒ 433 MHz ☒ 868 MHz ☐ 915 MHz</td>
</tr>
<tr>
<td>Adaptive Data Rate (ADR) supported?</td>
<td>☒ Yes ☐ No</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>☐ V1.0.1 ☒ V1.0.2 ☒ V1.0.4</td>
</tr>
<tr>
<td>Output Power</td>
<td>14 dBm</td>
</tr>
<tr>
<td>Number / Type of Antenna(s)</td>
<td>Spring Antenna or Sticker Antenna</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>2.0dB</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 Alliance End Device certification Requirements for All Regions Version 1.1” Chapter 2.

1.3 DUT Setup

Figure 1 DUT Setup
1.4 Protocol Testing according to LoRaWAN™ specification V1.0.4

Detailed Test Results:

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

Supported Optional Features:

Adaptive Data Rate (ADR): Yes
DR6 (SF7BW250): No
DR7 (FSK50): No
Min TX Power: Yes (Tx Power Id = 7)

Remarks: None

Result: The device passed the test without limitations.