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

“CMi4110Int”

for the Customer

“Elvaco AB”

Jens Lerner
Yavuz Turan

23rd 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 V1.0.2

Company and Contact Information:
Elvaco AB
Andréas Johansson
Kabelgatan 2T
434 37 Kungsbacka
Sweden
Tested Device: CMi4110Int
Hardware version: 2B
Firmware version: 1.0.7
End-device identifier: fe50001013a1994
LoRa Device Class: A
LoRaWAN Specification version: V1.0.2
Certification requirements: LoRa End Device Certification EU Version 1.6
Frequency band(s) tested: 868 MHz
Test Equipment: Test Software Version: 1.1.16
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: May 23rd, 2021

The Test Report, No. 6210470 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>CM4110Int</td>
</tr>
<tr>
<td>Product Vertical(s)</td>
<td>Buildings, Utilities</td>
</tr>
<tr>
<td>Product Version</td>
<td>2C</td>
</tr>
<tr>
<td>Series (if any)</td>
<td>N/A</td>
</tr>
<tr>
<td>Hardware Version</td>
<td>2B</td>
</tr>
<tr>
<td>Firmware Version</td>
<td>1.0.7</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) sup-</td>
<td>☒ Yes ☐ No</td>
</tr>
<tr>
<td>ported?</td>
<td></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</td>
</tr>
<tr>
<td>Output Power</td>
<td>14 dBm</td>
</tr>
<tr>
<td>Number / Type of Antenna(s)</td>
<td>1 Internal antenna (external antenna option available)</td>
</tr>
<tr>
<td>Antenna Gain</td>
<td>0 dB</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 EU863-870 MHz Version 1.6” Chapter 2.

1.3 DUT Setup

![Figure 1 DUT Setup](image)
Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN™ specification V1.0.2

Detailed Test Results:

Device Activation (Activation by Personalization): **PASS**
Test Mode Activation (Over the Air Activation): **PASS**
Test Application Functionality: **PASS**
New Channel Request: **PASS**
Channel Plan Usage: **PASS**
Cryptography: **PASS**
Packet Error Rate RX2 SF12: **PASS**
Downlink Window Timing: **PASS**
Frame Sequence Number: **PASS**
Confirmed Packets: **PASS**
Device Status 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**
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**
Device Deactivation: **PASS**

Supported Optional Features:

- Adaptive Data Rate (ADR): Yes
- DR6 (SF7BW250): Yes
- DR7 (FSK50): No
- Link ADR Request Block: Yes
- Di Channel Request: Yes
- Range 6dB: Yes
- Join Synch DevNonce: No
- Confirmed Re-transmissions: Yes (Max retries 7)

Remarks: None

Result: The device passed the test without limitations.