



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

“M8 and caltos E ”

for the Customer

“ZENNER Int. GmbH & Co. KG ”

Dietmar Krebs

Yavuz Turan

17th December, 2019

Administrative Summary

Location: IMST GmbH, Test Centre, Kamp-Lintfort, Germany

Responsible Test Engineer: Yavuz Turan, Dietmar Krebs

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

Company and Contact Information:

ZENNER Int. GmbH & Co. KG

Römerstadt 6

66121 Saarbrücken

Germany

Tested Device: M8 and caltos E

Firmware version: 1.8.0

Hardware version: 3.2

End-device identifier: 04B64800000FEFE

LoRa Device Class: A

LoRaWAN Specification version: V1.0.2

Certification requirements: LoRa End Device Certification EU Version 1.5

Frequency band(s) tested: 868 MHz

Test Equipment: Test Software Version: 1.1.11

IMST LGW (iC880A + Raspberry Pi): Gateway software version 5.0.1

Packet forwarder software version 4.0.1

Test Result: PASS

Chief Test Engineer: Dietmar Krebs
Dept. Test Center

Date: December 17th, 2019

The Test Report, No. 6191558 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: *Yavuz Turan*
Yavuz Turan
Test Engineer

Approved: *Dietmar Krebs*
Dietmar Krebs
Quality Engineer

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1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	M8 and caltos E
Kind of product	Heat cost allocator
Series (if any)	Superstatic / Supercal
Hardware Version	3.2
Firmware Version	1.8.0
Type of DUT	<input checked="" type="checkbox"/> Module / End Device <input type="checkbox"/> Gateway / Concentrator
Geographical area of operation	<input checked="" type="checkbox"/> Europe <input type="checkbox"/> USA
Operating frequency	<input type="checkbox"/> 433 MHz <input checked="" type="checkbox"/> 868 MHz <input 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"/> V1.0.1 <input checked="" type="checkbox"/> V1.0.2
Output Power	14dBm
Number / Type of Antenna(s)	N/A
Antenna Gain	N/A

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 EU V1_5” Chapter 3.

1.3 DUT Setup

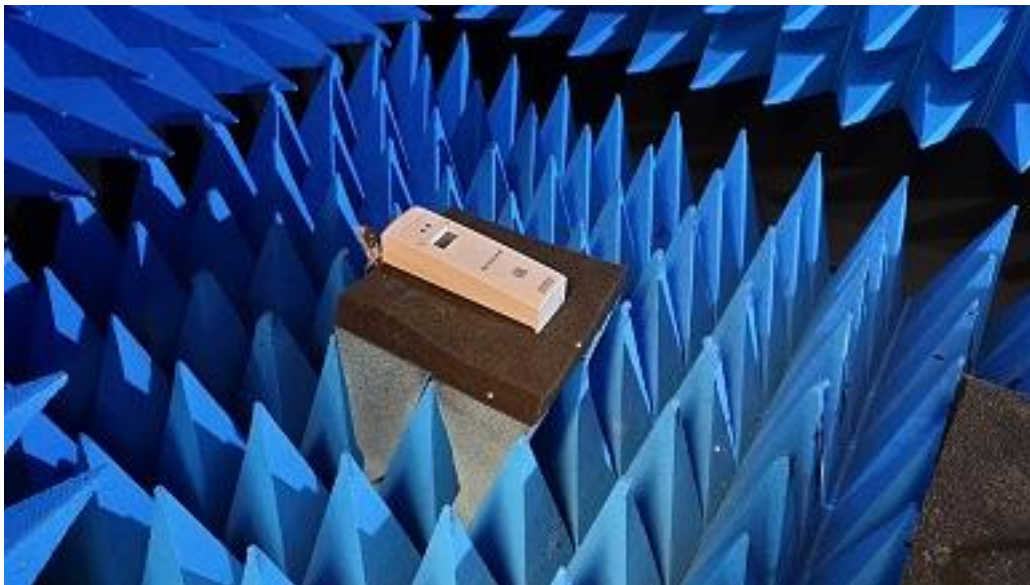


Figure 1 DUT Setup

Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN™ specification V1.0.2

Detailed Test Results:

Device Activation (Activation by Personalization): **PASS**

Test Mode Activation (Over the Air Activation): **PASS**

Test Application Functionality: **PASS**

Packet Error Rate RX2 SF12: **PASS**

Cryptography: **PASS**

Downlink Window Timing: **PASS**

Frame Sequence Number: **PASS**

Device Status Request: **PASS**

Mac Commands: **PASS**

New Channel Request: **PASS**

Di Channel Request Mac Command: **PASS**

Confirmed Packets: **PASS**

RX Parameter Setup Request: **PASS**

RX Timing Setup Request: **PASS**

Link ADR Request: **PASS**

Packet Error Rate RX1 Window: **PASS**

Packet Error Rate RX2 Window: **PASS**

Supported Optional Features:

Adaptive Data Rate (ADR): Yes

DR6 (SF7BW250): No

DR7 (FSK50): No

Link ADR Request Block: Yes

Di Channel Request: Yes

Range 6dB Yes

Remarks: None.

Result: The device passed the test without limitations.