Report for Test of Conformance to LoRaWAN™ V1.0.1

for the Device

"FMLORA-U-32L1"

for the Customer

Miromico AG

Markus Ridder

Annette Schramm.

25. Aug. 2016

Administrative Summary

Location: IMST GmbH, Test Centre, Kamp-Lintfort, Germany
Responsible Test Engineer: Markus Ridder

Subject: Test of Conformance to LoRaWAN™ Specification V1.0.1

Company and Contact Information:
Miromico AG
Herr Marcel Wappler
Gallusstrasse 4
8006 Zürich
Switzerland

Tested Device: FMLORA-U-32L1
Firmware version: V1.5
Hardware version: Rev 2
End-device identifier: 0x236107B0
LoRa Device Class: A
LoRaWAN Specification version: V1.0.1
Certification requirements: LoRa End Device Certification EU Version 1.2
Frequency band(s) tested: 868 MHz
Test Equipment: Test Software Version: 1.1.7
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 Center

Date: August 25th, 2016

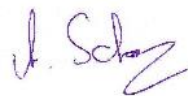The Test Report, No. 6160366 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Approved:

      Markus Ridder   Annette Schramm
      Test Engineer   Quality Engineer

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1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	FMLORA-U-32L1
Kind of product	FMLORA
Series (if any)	FMLORA
Hardware Version	Rev 2
Firmware Version	V1.5
Type of DUT	☒ Module / End Device ☐ Gateway / Concentrator
Geographical area of operation	☒ Europe ☐ USA
Operating frequency	☐ 433 MHz
	☒ 868 MHz
	☒ 915 MHz
Adaptive Data Rate (ADR) supported?	☒ Yes ☐ No
Optional data rates supported?	☒ DR6 ☐ DR7
Activation possibilities	☐ Over the air ☒ by personalization ☐ both
Test According LoRaWAN™ Spec	☐ V1.0 ☒ V1.0.1
Output Power	external or integrated
Number / Type of Antenna(s)	1 / 2
Antenna Gain	- / 0 dBi

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_1" Chapter 3.

1.3 DUT Setup

Figure 1 DUT Setup

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Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN™ specification V1.0.1

Detailed Test Results:

Test Mode Activation (Activation by Personalization): **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**
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): Yes

Remarks: None.

Result: The device passed the test without limitations.

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