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

"TX TEMP INS 600-031 "

for the Customer

"Enless Wireless"

Dietmar Krebs
Yavuz Turan

3rd February, 2020

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:
Enless Wireless
45 ter avenue de Verdun
33520 Bruges
FRANCE
Tested Device: TX TEMP INS 600-031
Firmware version: Rev 1.01
Hardware version: Rev 2.20
End-device identifier: 70B3D54FDFFFF001
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: February 3rd, 2020

The Test Report, No. 6200028 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Approved:

Yavuz Turan	Dietmar Krebs
Test Engineer	Quality Engineer

1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	TX TEMP INS 600-031
Kind of product	Temperature measurement device transmitting period- ically on LoRaWAN
Series (if any)	
Hardware Version	Rev 2.20
Firmware Version	Rev 1.01
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	☐ V1.0.1 ☒ V1.0.2
Output Power	16 dBm
Number / Type of Antenna(s)	1
Antenna Gain	0 dB

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

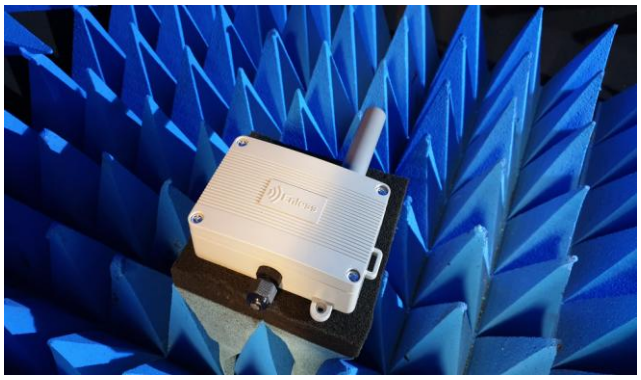

Figure 1 DUT Setup

Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN™ specification V1.0.2

Detailed Test Results:

Device Activation: **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):	Yes
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.