



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 Class A (US915)

for the Device

“TX TEMP INS 600-131”

for the Customer

“Enless Wireless”

Jens Lerner

Yavuz Turan

16th April, 2024

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 (Class A for US915)

Company and Contact Information:

Enless Wireless

Théo Benissan

6bis rue du Temple

33000 Bordeaux

France

Tested Device: TX TEMP INS 600-131

Hardware version: Rev 3.00

Firmware version: V2.02.01

End-device identifier: 70b3d54fd000e1c2

LoRaWAN® Device Class: A

LoRaWAN Specification version: V1.0.4

Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirements V1.6

Frequency band(s) tested: 915 MHz

Test Equipment: LCTT v3.12.0_R1

8x IMST LGW (iC980A + Raspberry Pi): Gateway software version 4.1.3

Packet forwarder software version 3.1.0

Test Result: PASS

Quality Engineer: Jens Lerner

Date: April 16th, 2024

The Test Report, No. 6240270 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility:  Approved: 
Yavuz Turan Jens Lerner
Test Engineer Quality Engineer

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1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	TX TEMP INS 600-131
Product Vertical(s)	Buildings
Series (if any)	N/A
Hardware Version	Rev 3.00
Firmware Version	V2.02.01
LoRaWAN® Device Class	A
Type of DUT	<input type="checkbox"/> Module <input checked="" type="checkbox"/> End Device/Sensor <input type="checkbox"/> others
Geographical area of operation	<input type="checkbox"/> Europe <input checked="" type="checkbox"/> USA <input type="checkbox"/> Australia
Operating frequency	<input type="checkbox"/> 433 MHz <input type="checkbox"/> 868 MHz <input checked="" type="checkbox"/> 915 MHz
Adaptive Data Rate (ADR) supported?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Optional data rates supported?	<input checked="" type="checkbox"/> DR6 <input type="checkbox"/> DR7
Activation possibilities	<input checked="" type="checkbox"/> Over the air <input type="checkbox"/> by personalization <input type="checkbox"/> both
Test According LoRaWAN® Spec	<input type="checkbox"/> V1.0.1 <input type="checkbox"/> V1.0.2 <input checked="" type="checkbox"/> V1.0.4
Output Power	14 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 Alliance End Device Certification Requirements for All Regions Version 1.6” Chapter 2.

1.3 DUT Setup

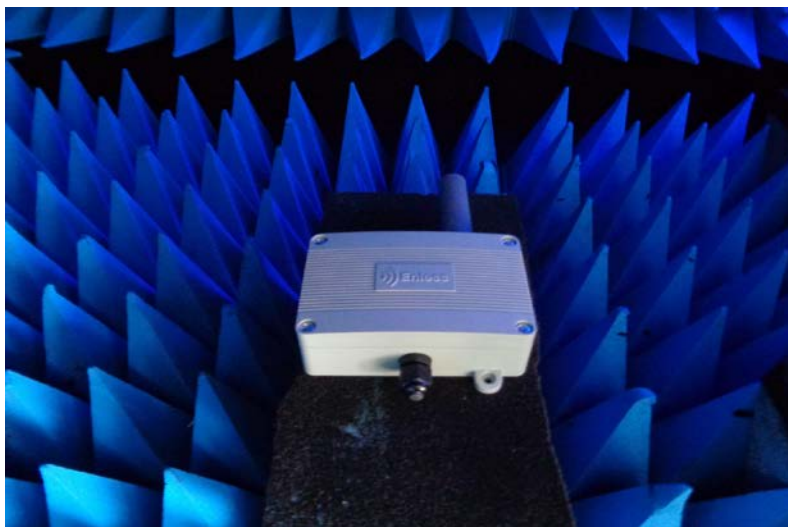


Figure 1 DUT Setup

Applied Methods of Measurement

1.4 Protocol Testing according to LoRaWAN® specification V1.0.4 (Class A device for US915)

Detailed Test Results:

Test Case ID	Description	Verdict	Date
TP_A_US915_ED_MAC_104_BV_000	Activation Pre-test	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_001_A	Over the Air Activation	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_002	Cryptography	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_003	Downlink Sequence Number	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_004	Confirmed Frames	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_005	DevStausReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_006	NewChannelReq MAC Command for Fixed Channel plan devices only	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_007	DIChannelReq for Fixed Channel plan devices only	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_008	RXParameterSetupReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_009	RXTimingSetupReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_010	TXParamSetupReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_011	LinkCheckReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_012A	LinkADRReq MAC Command (Part 1)	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_012B	LinkADRReq MAC Command (Part 2)	PASS	2024-04-15
TP_A_US915_ED_MAC_104_BV_013	DutyCycleReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_014	DeviceTimeReq MAC Command	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_015A	RX1 Receive Window Test (Part 1)	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_015B	RX1 Receive Window Test (Part 2)	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_016	RX2 Receive Window Test	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_017	RX1 and RX2 simultaneous frames	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_018	RX Oversized Payload	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_019A	Maximum Allowed Payload (Part 1)	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_019B	Maximum Allowed Payload (Part 2)	PASS	2024-04-15
TP_A_US915_ED_MAC_104_BV_020	MAC Command(s) in App-Payload and/or Frame Options	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_021	Multiple MAC Commands prioritization	PASS	2024-04-11
TP_A_US915_ED_MAC_104_BV_022	FPort 224 Deactivation	PASS	2024-04-15

Supported Optional Features:

Adaptive Data Rate (ADR): Yes
 DR6 (SF7BW250): Yes
 DR7 (FSK50): No

Additional Tests By The Manufacturer:

Retransmission Back-Off for OTA devices only: **PASS**

Remarks: None

Result: The device passed the test without limitations.