Report for Test of Conformance to LoRaWAN™ V1.0.2

for the Device

"Wireless M-Bus Range Extender"

for the Customer

"IMST GmbH"

Jens Lerner

Yavuz Turan

23rd June, 2020

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:
IMST GmbH
Heinz Syrzisko
Carl-Friedrich-Gauss-Str. 2-4
47475 Kamp-Lintfort
Germany
Tested Device: Wireless M-Bus Range Extender
Firmware version: V0.9
Hardware version: C100
End-device identifier: 70b3d58ff003a12d
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
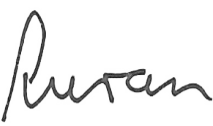Packet forwarder software version 4.0.1

Test Result: PASS

Quality Engineer: Jens Lerner

Date: June 23rd, 2020

The Test Report, No. 6200609 has the following conclusion:

The device has PASSED the tests hereunder.

Responsibility: Approved:

Yavuz Turan   Jens Lerner
Test Engineer   Quality Engineer

LoRa® Alliance

1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	Wireless M-Bus Range Extender
Product Vertical(s)	Home/Consumer
Series (if any)	
Hardware Version	C100
Firmware Version	V0.9 BC103
Type of DUT	☐ Module ☐ End Device/Sensor ☒ others
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	13 dBm
Number / Type of Antenna(s)	Integrated antenna
Antenna Gain	1.5dBi

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

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**
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**
New Channel 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):	Yes
Link ADR Request Block:	Yes
Di Channel Request:	Yes
Range 6dB:	Yes
Join Synch DevNonce:	No

Remarks: None.

Result: The device passed the test without limitations.

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