



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

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# Report for Test of Conformance to LoRaWAN™ V1.0.4 Class A

for the Device

“Wireless M-Bus Range Extender”

for the Customer

**“IMST GmbH”**

Jens Lerner

Yavuz Turan

11<sup>th</sup> November, 2021

## 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 EU)

### 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

Hardware version: C100

Firmware version: V1.1

End-device identifier: 70B3D58FF003A12D

LoRa Device Class: A

LoRaWAN Specification version: V1.0.4

Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirement V1.4

Frequency band(s) tested: 868MHz

Test Equipment: Test Software Version: 1.2

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: November 11<sup>th</sup>, 2021

The Test Report, No. 6210887 has the following conclusion:

**The device has PASSED the tests hereunder.**

Responsibility:   
Yavuz Turan  
Test Engineer

Approved:   
Jens Lerner  
Quality Engineer

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# 1 Description of the Device Under Test (DUT)

## 1.1 General

Item	Value
Product name	Wireless M-Bus Range Extender
Product Vertical(s)	Buildings, Cities, Home / Customer, Industry
Series (if any)	
Hardware Version	C100
Firmware Version	V1.1
Type of DUT	<input type="checkbox"/> Module <input type="checkbox"/> End Device/Sensor <input checked="" type="checkbox"/> others
Geographical area of operation	<input checked="" type="checkbox"/> Europe <input type="checkbox"/> USA <input type="checkbox"/> Australia
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 checked="" type="checkbox"/> DR6 <input checked="" 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	13 dBm
Number / Type of Antenna(s)	Integrated antenna
Antenna Gain	1.5 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 Alliance End Device certification Requirements for All Regions Version 1.4” 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 EU868)

### Detailed Test Results:

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

Cryptography: **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**

Duty Cycle Request: **PASS**

Device Time 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**

Mac Commands Buffer: **PASS**

Device Deactivation: **PASS**

### Supported Optional Features:

Adaptive Data Rate (ADR): Yes

Min TX Power: Yes

SF7BW250 (DR6) Yes

FSK50 (DR7) Yes

Permanent Class C No

Remarks: None

**Result: The device passed the test without limitations.**