



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 EU868 (Class A & Class C)

for the Device

“iU891A-XL”

for the Customer

“IMST GmbH”

Jens Lerner

Yavuz Turan

17th May, 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 (EU868)

Company and Contact Information:

IMST GmbH

Heinz Syrzisko

Carl-Friedrich-Gauss-Str. 2-4

47475 Kamp-Lintfort

Germany

Tested Device: iU891A-XL

Hardware version: A

Firmware version: V1.0

End-device identifier: 70B3D58FF003EB8C

LoRa Device Class: A & C

LoRaWAN Specification version: V1.0.4

Certification requirements:

LW1.0.4 End Device Certification V1.6.1

Frequency band(s) tested: 863-870 MHz

Test Equipment: LCTT v3.12.0_R1

2x 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: May 17th, 2024

The Test Report, No. 6240401 has the following conclusion:

The device has PASSED the tests hereunder.

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

Copyright Notice & Disclaimer: No part of this test report may be reproduced without written permission of IMST GmbH. The test results herein only refer to the tested sample. IMST GmbH cannot be made responsible for any generalizations or conclusions drawn from the test results presented herein concerning further samples of the tested device. Modification of the tested sample(s) is prohibited and leads to invalidity of this report.

1 Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	iU891A-XL
Product Vertical(s)	Agriculture, Buildings, Cities, Environment, Home/Consumer, Industry, Infrastructure, Industrial/Hazardous, Utilities, Transport/Logistics
Series (if any)	N/A
Hardware Version	A
Software Version	N/A
Firmware Version	V1.0
Type of DUT	<input type="checkbox"/> Module <input checked="" type="checkbox"/> End Device/Sensor <input 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	21dbm max (EIRP)
Number / Type of Antenna(s)	One SMA connector (external antenna)
Antenna Gain	N/A

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 1.6.1” 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 (EU868)

Detailed Test Results Class A & Class C:

Test Case ID	Description	Verdict	Date
TP_A_EU868_ED_MAC_104_BV_000	Activation Pre-test	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_001_A	Over the Air Activation	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_002	Cryptography	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_003	Downlink Sequence Number	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_004	Confirmed Frames	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_005	DevStausReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_006	NewChannelReq MAC Command for Dynamic Channel plan devices only	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_007	DlChannelReq for Dynamic Channel plan devices only	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_008	RXParameterSetupReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_009	RXTimingSetupReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_010	TXParamSetupReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_011	LinkCheckReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_012A	LinkADRReq MAC Command (Part 1)	PASS	2024-05-16
TP_A_EU868_ED_MAC_104_BV_012B	LinkADRReq MAC Command (Part 2)	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_013	DutyCycleReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_014	DeviceTimeReq MAC Command	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_015A	RX1 Receive Window Test (Part 1)	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_015B	RX1 Receive Window Test (Part 2)	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_016	RX2 Receive Window Test	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_017	RX1 and RX2 simultaneous frames	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_018	RX Oversized Payload	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_019A	Maximum Allowed Payload (Part 1)	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_019B	Maximum Allowed Payload (Part 2)	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_020	MAC Command(s) in App-Payload and/or Frame Options	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_021	Multiple MAC Commands prioritization	PASS	2024-05-15
TP_A_EU868_ED_MAC_104_BV_022	FPort 224 Deactivation	PASS	2024-05-16
TP_C_EU868_ED_MAC_104_BV_000	Activation and Usage	PASS	2024-05-16
TP_A_EU868_ED_MAC_104_RETRANS MISSION_BACKOFF	Retransmission back-off tests for power-up of device	PASS	2024-05-17

Supported Optional Features:

Adaptive Data Rate (ADR):	Yes
SF7BW250 (DR6)	Yes
FSK50 (DR7)	Yes
Class C	Yes

Remarks: None

Result: The device passed the test without limitations.