



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 (AS)

for the Device

“Viloc Module”

for the Customer

“Viloc NV”

Jens Lerner

Yavuz Turan

17<sup>th</sup> December, 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 Asia)

### Company and Contact Information:

Viloc NV

Tim Gestels

Meet District, Posthofbrug 6/8

2600 Antwerpen

Belgium

Tested Device: Viloc Module

Hardware version: Stabil2

Firmware version: 1.3

End-device identifier: ST2

LoRa Device Class: A

LoRaWAN Specification version: V1.0.4

Certification requirements: LoRaWAN 1.0.4 End Device Certification Requirement for All Regions V1.4

Frequency band(s) tested: 923-1 MHz

Test Equipment: Test Software Version: 1.2

2x 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: December 17<sup>th</sup>, 2021

The Test Report, No. 6210995 has the following conclusion:

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

Responsibility:   
Yavuz Turan  
Test Engineer

Approved:   
Jens Lerner  
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	Viloc Module
Product Vertical(s)	Cities, Industrial/Hazardous
Series (if any)	N/A
Hardware Version	Stabil2
Firmware Version	1.3
Type of DUT	<input checked="" type="checkbox"/> Module <input type="checkbox"/> End Device/Sensor <input type="checkbox"/> others
Geographical area of operation	<input type="checkbox"/> Europe <input type="checkbox"/> USA <input type="checkbox"/> Australia <input checked="" type="checkbox"/> Asia (923-1)
Operating frequency	<input type="checkbox"/> 433 MHz <input checked="" type="checkbox"/> 923 MHz <input 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 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	22 dBm
Number / Type of Antenna(s)	1 PIFA antenna
Antenna Gain	0 dBm

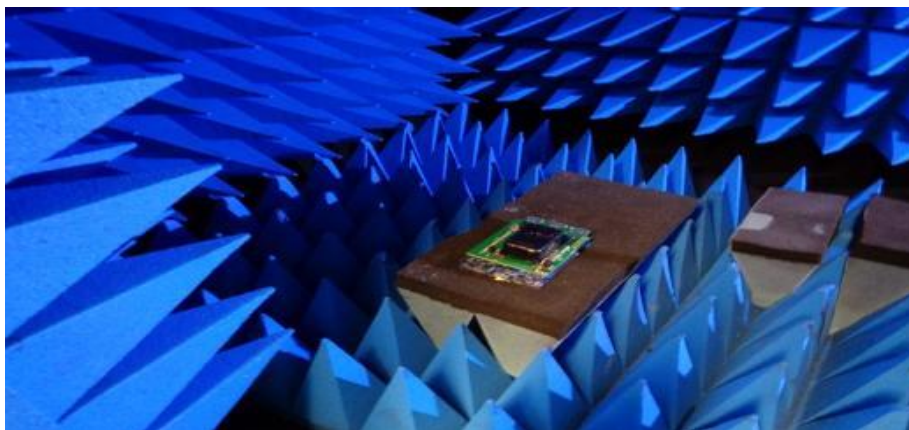
**Table 1 Device Information**

## 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 AS 923-1)

### 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 No

FSK50 No

Permanent Class C No

Remarks: None

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