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The facility is authorized by the LoRa[®] Alliance for testing in accordance to the LoRaWAN[®] Specification V1.0.4.

LoRa[®] Test Report

LoRaWAN[®] V1.0.2 Class A (EU868)

for the Device

“Hydrus 2.0 Type 173”

for the Customer

“Diehl Metering GmbH”

Authors:

Yavuz Turan

Jens Lerner

March 25th, 2025

Administrative Summary

Test Location: IMST GmbH, Testcenter, Kamp-Lintfort, Germany

Test Engineer(s): Yavuz Turan, Jens Lerner

Subject: Test of Conformance to LoRaWAN® Specification V1.0.2 (Class A for EU868)

Customer Company and Contact Information:

Diehl Metering GmbH
Robert Lange
Donaustraße 120
90451 Nürnberg
Germany

Device Information:

Tested Device: Hydrus 2.0 Type 173
Hardware Version: 3137774
Firmware Version: 3.2.10
End-device identifier: 94A40C03020048F6
LoRaWAN® Device Class: A
LoRaWAN® Specification Version: V1.0.2

Test Specification & Equipment:

LoRaWAN® 1.0.4 End Device Certification Requirements V1.6
Frequency band(s) tested: 868 MHz
Test Equipment: LCTT v3.15.0_R1
Supplementing Equipment: 1x IMST LGW (iC980A + Raspberry Pi): Gateway software version 5.0.1, Packet forwarder software version 4.0.1

Test Report Date: March 25th, 2025

The Test Report, No. 6250079 has the following conclusion:

The device has PASSED the tests hereunder.



Yavuz Turan
Test Engineer



Jens Lerner
Approved By Quality Engineer

1. Description of the Device Under Test (DUT)

1.1 General

Item	Value
Product name	Hydrus 2.0 Type 173
Product Vertical(s)	smart-buildings-facilities-management,smart-cities,smart-industry-industrial-iot,smart-metering-smart-utilities
Series (if any)	N/A
Hardware Version	3137774
Software Version	N/A
Firmware Version	3.2.10
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 checked="" type="checkbox"/> EU <input type="checkbox"/> US <input type="checkbox"/> AU <input type="checkbox"/> AS-1 <input type="checkbox"/> AS-2 <input type="checkbox"/> AS-3 <input type="checkbox"/> IN <input type="checkbox"/> KR
Operating frequency	<input checked="" type="checkbox"/> EU863-870 MHz <input type="checkbox"/> US902-928 MHz <input type="checkbox"/> AU915-928 MHz <input type="checkbox"/> AS923-1 <input type="checkbox"/> AS923-2 <input type="checkbox"/> AS923-3 <input type="checkbox"/> IN865-867 MHz <input type="checkbox"/> KR920-923 MHz <input type="checkbox"/> RU864-870 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 checked="" type="checkbox"/> V1.0.2 <input type="checkbox"/> V1.0.4 * Allowed for Certification by Similarity only
Type and Version of used Stack	<input type="checkbox"/> Own <input type="checkbox"/> IBM <input type="checkbox"/> Stackforce <input checked="" type="checkbox"/> Other V1.1.9

Table 1 Device Information

1.1.1 Supported Optional Features, as stated by Manufacturer

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

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 Device Test Conditions

DUT Receipt Date: March 21st, 2025

DUT Test Date: March 24th, 2025

No modifications by test laboratory are made prior to testing.

1.4 DUT Setup

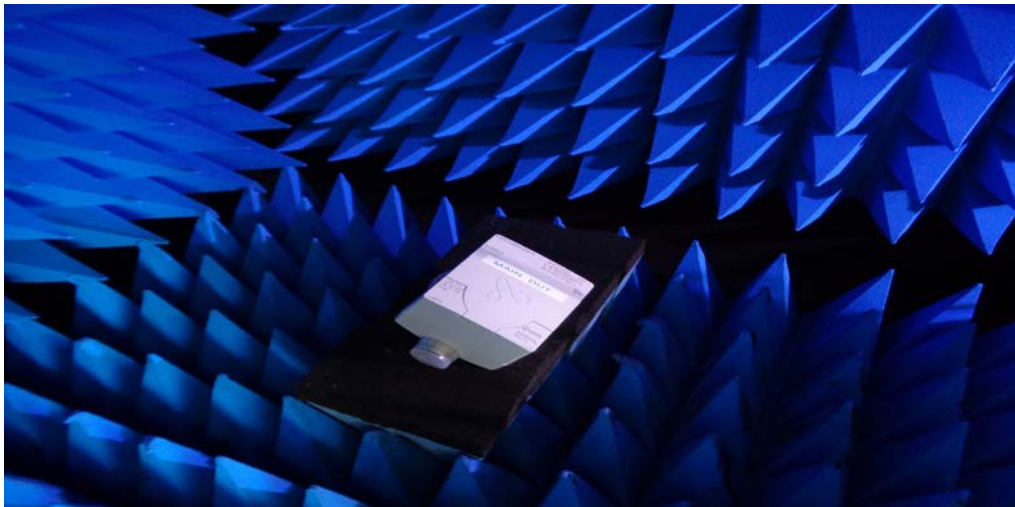


Figure 1 DUT Setup

1.5 Applied Methods of Measurement

Protocol Testing according to LoRaWAN® specification V1.0.2 (Class A for EU868)

1.5.1 Detailed Test Results: Class A

Device Activation: **PASS**
Over the Air Activation: **PASS**
Activation by Personalization: **PASS**
Channel Plan and Usage: **PASS**
AES Encryption and Message Integrity: **PASS**
Downlink Error Rate: **PASS**
Downlink Window Timing: **PASS**
Frame Sequence Number: **PASS**
Device Status Request: **PASS**
MAC Commands: **PASS**
New Channel Request: **PASS**
Di Channel Request: **PASS**
Confirmed Packets: **PASS**
RX Timing Setup Request: **PASS**
RX Parameter Setup Request: **PASS**
Link Check Request: **PASS**
Link ADR Request: **PASS**
Device Time Request: **PASS**
RX1 Receive Window Test: **PASS**
RX2 Receive Window Test: **PASS**
RX1 and RX2 Simultaneous Frames: **PASS**
TX Parameter Setup Request: **PASS**
RX Oversized Payload: **PASS**
Maximum Allowed Payload: **PASS**

Remarks: None

Result: The device passed the test without limitations.