

LoRa accredited Test Lab



Test report No:

NIE: 67779RLR.001

Test report

LoRa Alliance End Device Certification Requirements

(*) Product Name	Wireless radio water meter data logger APULSE-W x1F5
(*) Product Version	APULSE-W x1F5
(*) Other identification of the product	HW Version: 1 FW Version: 02
(*) Detailed Description	<p>APULSE-W is an autonomous, battery powered IoT radio extension module installed on various water meters.</p> <p>APULSE-W receives data from AMR-ready water meters and transmits them via Sigfox or Lora low power network. The device registers consumption profile as well as magnet and tamper detection.</p> <p>The module and water meter are inductively coupled what prevents from magnetic fraud. Sophisticated engineering design guarantees 10 years battery life time with daily data transmission. APULSE-W radio extension module is a perfect choice for both fixed and walk-by systems.</p>
Manufacturer	AIUT sp. z o. o Wyczółkowskiego 113 44-109, Gliwice (Poland)
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN V1.0.2
Test Specification.....:	LoRaWAN® European EU 863-870MHz Region End Device Certification Requirements document V1.6
LoRa_Certification_Questionnaire:	LoRaWAN_Certification_Questionnaire_V1.2
Test procedure(s).....:	PELR000_00 LoRa Alliance Testing Procedure
(*) Supported Optional Features	
Adaptive Data Rate (ADR).....:	Yes
SF7BW250.....:	No
FSK50	No
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Noemi Perez IoT Lab Manager
Date of issue	2021-03-31
Report template No	FLR001_04 (* "Data provided by the client")

Index

Competences and guarantees	3
General conditions	3
Uncertainty	4
Data provided by the client.....	4
Usage of samples	4
Test sample description	4
Identification of the client.....	4
Testing period and place.....	5
Document history	5
Remarks and comments	5
Means of testing identification.....	5
Test setup.....	6
Testing verdicts.....	6
Appendix A: Test results	7
Appendix B: ICS	9
Appendix C: Photographs	10

Competences and guarantees

DEKRA Testing and Certification S.A.U is a LoRa Alliance accredited Test Lab competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, DEKRA Testing and Certification S.A.U. has a calibration and maintenance program for its measurement equipment.

DEKRA Testing and Certification S.A.U. guarantees the reliability of the data presented in this report, which is the result of the measurements and the tests performed to the item under test on the date and under the conditions stated on the report and, it is based on the knowledge and technical facilities available at DEKRA Testing and Certification at the time of performance of the test.

DEKRA Testing and Certification S.A.U. is liable to the client for the maintenance of the confidentiality of all information related to the item under test and the results of the test.

The results presented in this Test Report apply only to the particular item under test established in this document.

IMPORTANT: No parts of this report may be reproduced or quoted out of context, in any form or by any means, except in full, without the previous written permission of DEKRA Testing and Certification S.A.U.

General conditions

1. This report is only referred to the item that has undergone the test.
2. This report does not constitute or imply on its own an approval of the product by the Certification Bodies or competent Authorities.
3. This document is only valid if complete; no partial reproduction can be made without previous written permission of DEKRA Testing and Certification S.A.U.
4. This test report cannot be used partially or in full for publicity and/or promotional purposes without previous written permission of DEKRA Testing and Certification S.A.U. and the Accreditation Bodies.

Uncertainty

N/A

Data provided by the client

The following data has been provided by the client:

1. Information relating to the description of the sample ("Product Name", "Product Version", "Other identification of the product", "Detailed Description", "Supported Optional Features" and "Test Sample Description").
3. The ICS provided by the customer via the LoRaWAN Certification Questionnaire V2.1 and used for testing are indicated in Annex B.

DEKRA Testing and Certification S.A.U. declines any responsibility with respect to the information provided by the client and that may affect the validity of results.

Usage of samples

Samples undergoing test have been selected by: the client

Sample M/01 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67779/001	LoRa Device with module inside (ABP mode)	APULSE-W x1F5	01925302	2021-03-15

Sample M/02 is composed of the following elements:

Control N°	Description	Model	Serial N°	Date of reception
67779/002	LoRa Device with module inside (OTAA mode)	APULSE-W x1F5	01905302	2021-03-15

Test sample description(*)

Autonomous, battery powered IoT radio extension module installed on water meters.

Identification of the client

AIUT sp. z o. o
Wyczółkowskiego 113
44-109, Gliwice (Poland)

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2021-03-17
Date (finish)	2021-03-22

Document history

Report number	Date	Description
67779RLR.001	2021-03-31	First release (test report without logs to be uploaded to the public area of LoRa Alliance website).
67779RLR.002	2021-03-31	Identical test report as '67779RLR.001' with the addition of the test logs.

Remarks and comments

Testing was performed by: Daniel Ríos Toca and Jose Francisco González.

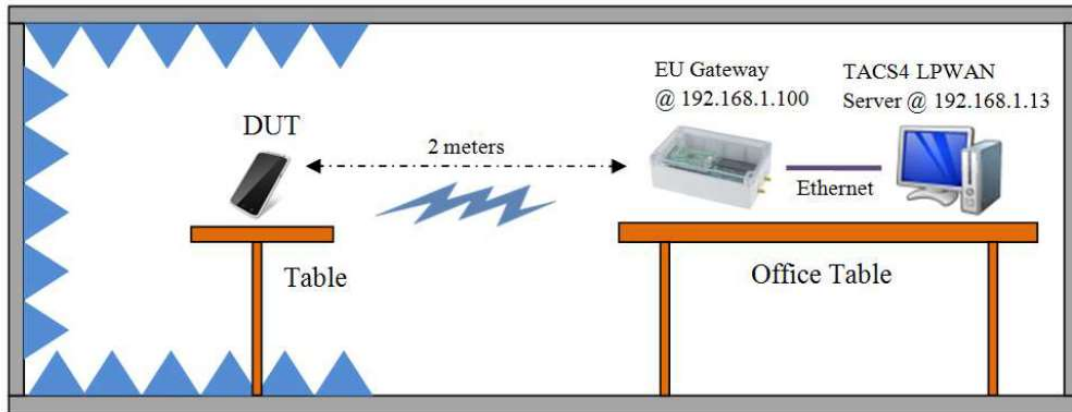
Means of testing identification

TEST SYSTEM	BANCO LORA EU		
Control Number	5866		
Control PC	Control No.	Equipment	Serial No.
	7218	Control PC with TACS4 v2.0.0_R1 and Technology Packet Version LORA v6.1.0_R1	-
LoRa Gateway	7342	Semtech GW	-
RF Shielded box	5387	RF Shielded Test Enclosure	0001114
Test Setup:	See "Test Setup" section.		

Test setup

TS1: This Test Setup has been used for EU testing:

SEMTECH EUROPEAN GATEWAY AND TACS4 LPWAN CONFIGURATION:



Testing verdicts

Not applicable :	N/A
Pass :	P
Fail :	F
Not measured :	N/M

Appendix A: Test results

Test campaign report

The abbreviations used in the header row of the test campaign report tables are:

Test Case ID :	As it can be found on the standard
Verdict:	Records the verdict assigned to each Test Case run to completion (<u>Testing verdicts</u>)
Date:	Date of the beginning of the execution.
Observations:	Provides a reference to additional information relevant to the test presented in “Test Setup” section.
Logs:	See 67779RLR.002

Test Case ID	Description	Date	Verdict	Observations
TP_A_EU868_ED_MAC_BV_000_A	Device activation (OTAA)	19/03/2021	P	
TP_A_EU868_ED_MAC_BV_000_B	Device activation (ABP)	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_001_A	Over The Air activation	18/03/2021	P	
TP_A_EU868_ED_MAC_BV_001_B	Activation by Personalization	18/03/2021	P	
TP_A_EU868_ED_MAC_BV_002	Test application functionality	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_003	AES encryption and message integrity	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_004	Downlink error rate	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_005	Downlink window timing	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_006	Frame sequence number	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_007	DevStatusReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_008	MAC Commands	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_009	NewChannelReq MAC command	18/03/2021	P	
TP_A_EU868_ED_MAC_BV_010	DIChannelReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_011	Confirmed packets	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_012	RXParamSetupReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_013	RXTimingSetupReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_014_A	LinkADRRReq MAC command (Part 1)	18/03/2021	P	
TP_A_EU868_ED_MAC_BV_014_B	LinkADRRReq MAC command (Part 2)	18/03/2021	P	
TP_A_EU868_ED_MAC_BV_015_A	RX1 Receive window test (Part 1)	22/03/2021	P	
TP_A_EU868_ED_MAC_BV_015_B	RX1 Receive window test (Part 2)	22/03/2021	P	
TP_A_EU868_ED_MAC_BV_016	RX2 Receive window test	17/03/2021	P	

TP_A_EU868_ED_MAC_BV_017	RX1 and RX2 simultaneous frames	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_018	TXParamSetupReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_019	LinkCheckReq MAC command	17/03/2021	P	
TP_A_EU868_ED_MAC_BV_020	RX Oversized payload	19/03/2021	P*	Test Case passes according to BUG 0011094
TP_A_EU868_ED_MAC_BV_021	Maximum Allowed payload	18/03/2021	P	

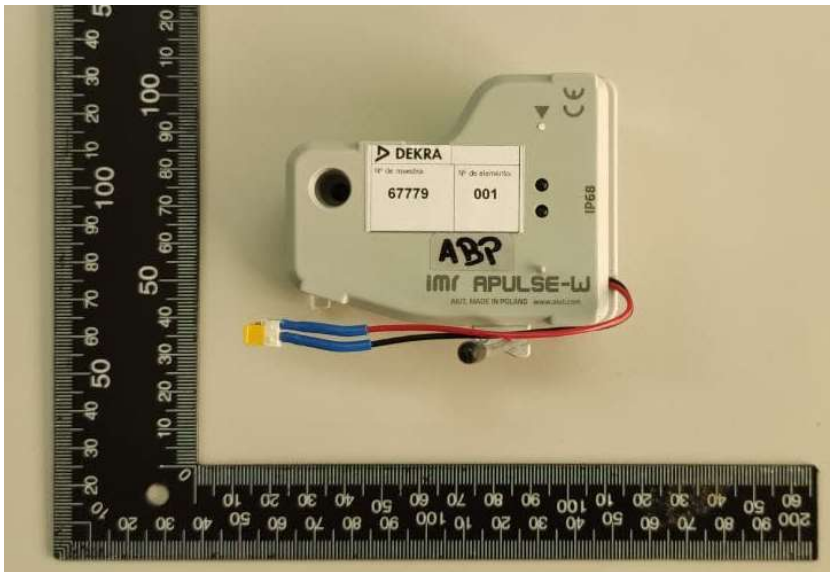
Appendix B: ICS

Implementation Conformance Statement (ICS)

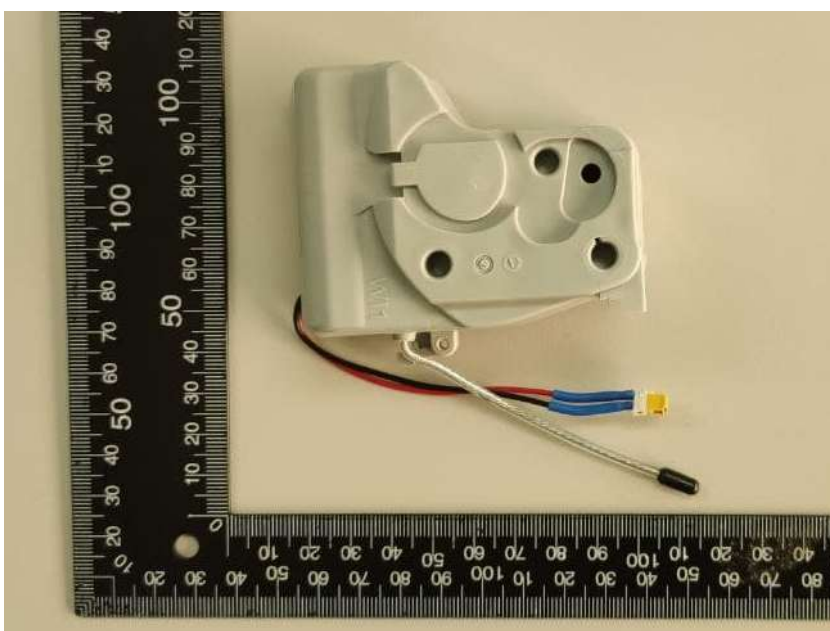
Name	Title	Groupname	Mandatory	Value
C_ISM_EU868	DUT works in Asia 923MHz ISM Band	BAND	C	FALSE
C_ISM_EU868	DUT works in EU 868MHz ISM Band	BAND	C	TRUE
C_ISM_IN865	DUT works in India 865-867 MHz ISM Band	BAND	C	FALSE
C_ISM_KR920	DUT works in South Korea 920MHz ISM Band	BAND	C	FALSE
C_ISM_US915	DUT works in USA 915MHz ISM Band	BAND	C	FALSE
C_CERT_102rB	DUT implements LoRaWAN v1.0.2rB certification	CERT	C	TRUE
C_CERT_103rA	DUT implements LoRaWAN v1.0.3rA (Class B)	CERT	C	FALSE
C_CERT_104	DUT implements LoRaWAN v1.0.4 certification	CERT	C	FALSE
C_CLASS_A	DUT is a Class A Device (All End Devices)	CLASS	C	TRUE
C_CLASS_B	DUT is a Class B Device (Beacon Mode)	CLASS	C	FALSE
C_ED_ADR	DUT supports Adaptive Data Rate (ADR) feature	ED	C	TRUE
C_ED_ADR_BLOCK	DUT supports LinkADRReq block	ED	C	FALSE
C_ED_CW	DUT supports Continuous Wave command	ED	C	TRUE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED	C	TRUE
C_ED_DR_DECAY	DUT implements Data Rate Decay	ED	C	FALSE
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA)	ED	C	TRUE
C_ED_RESET	DUT needs a reset after deactivating Test Mode	ED	C	TRUE
C_ED_TM_TRI	DUT supports Trigger Join Request command in Test	ED	C	TRUE

Appendix C: Photographs

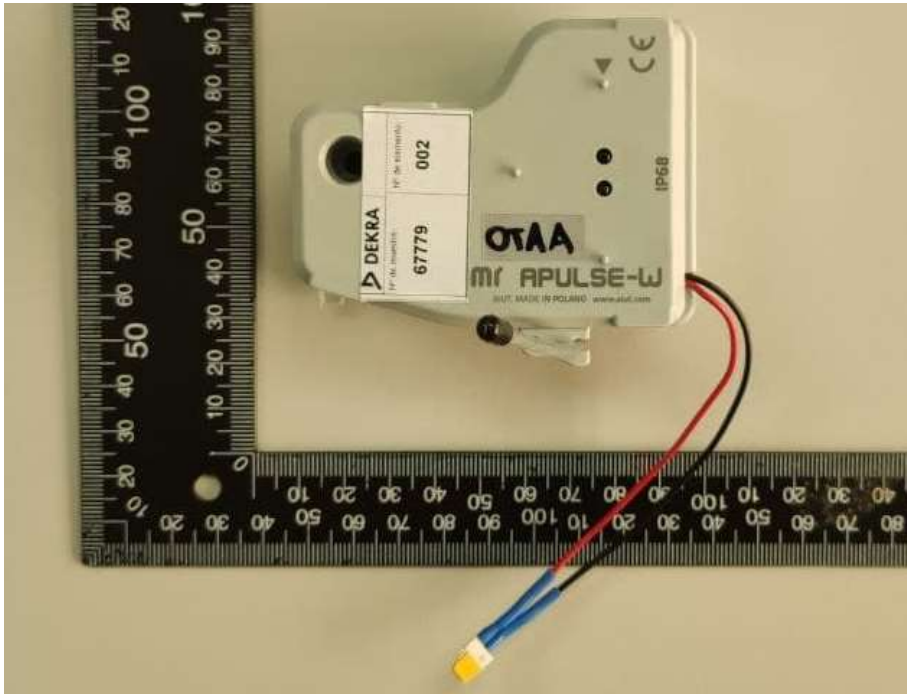
Front view (Sample M01)



Rear view (Sample M01)



Front view (Sample M02)



Rear view (Sample M02)

