



Test report No:
 NIE: 78041RLR.004

Test report

LoRa Alliance End Device Certification Requirements

(*) Identification of item tested	PipeBurst Pro WT500 – Wireless Water and Temperature Sensor
(*) Trademark	GreenField Direct, LLC
(*) Model and /or type reference tested	End Device
Other identification of the product	Final HW version: 1.2 Final SW Version: 2.19.24 Final FW Version: 1.7
(*) Features	Class A Over The Air Activation Mode supported
Manufacturer	GreenField Direct, LLC 23859 KZ Pkwy #4 Greenwood, NE 68366, United States
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN v1.0.4
Test Specification.....:	LoRa Alliance End-Device Certification Requirements for EU863-870 and US902-928
LoRa_Certification_Questionnaire.....:	LoRaWAN_Certification_Questionnaire_V2.4
Test procedure(s).....:	PELR000_01 LoRa Alliance Testing Procedure
Supported Optional Features	
Adaptive Data Rate (ADR).....:	Yes
SF7BW250.....:	No
FSK50	No
LR-FHSS	No
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Noemí Pérez Dans
Date of issue	2024-03-13
Report template No	FLR001_06 (* "Data provided by the client")

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Competences and guarantees

DEKRA Testing and Certification S.A.U. is a testing laboratory accredited by A2LA (The American Association for Laboratory Accreditation) to perform the test indicated in the Certificate 3350.01.

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.

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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.
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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 ("Identification of item tested ", "Trademark", "Model and /or type reference tested", "Derived model not tested", "Features" and "Test Sample Description").
2. The ICS provided by the customer via the LoRa_Certification_Questionnaire_V2.4 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: GreenField Direct, LLC

Sample M/01 is composed of the following elements:

Control N°	Description	Model	FW version	Serial N°	Date of reception
78041B/007	WT500 – Wireless Water and Temperature Sensor	WT500 – Wireless Water and Temperature Sensor	1.7	000CE300052DA5CB	05/03/2024

1. Sample M/01 has undergone the test(s) specified in subclause "Test method requested".

(*)Test sample description

The WT500 wireless water and temperature sensor continually monitors for the presence of water, temperature thresholds, and tamper events. With its sleek curvature and high gloss finish, the sensor is designed to blend into its environment. Auxiliary wired leak sensors can be used in conjunction with the WT500 to monitor hard to reach areas.

Identification of the client

GreenField Direct, LLC
23859 KZ Pkwy #4
Greenwood, NE 68366, United States

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2024-03-05
Date (finish)	2024-03-06

Document history

Report number	Date	Description
78041RLR.004	2024-03-13	First release

Environmental conditions

The following limits were not exceeded during the test:

Temperature	Min= 18 °C
	Max= 28 °C
Relative humidity	Min= 20 %
	Max= 75 %

Remarks and comments

Testing was performed by: Raúl Ramos Pérez

Means of testing identification

DEKRA Authorized Test Lab used the approved test environment recipe for their certification test results as follows:

LCTT GUI version	LCTT Test Cases Package Version	DUT inside RF Chamber	Gateways model
2.7.0	v3.12.0_R1	Yes	8 x CoreCell: SX1302C868GW1

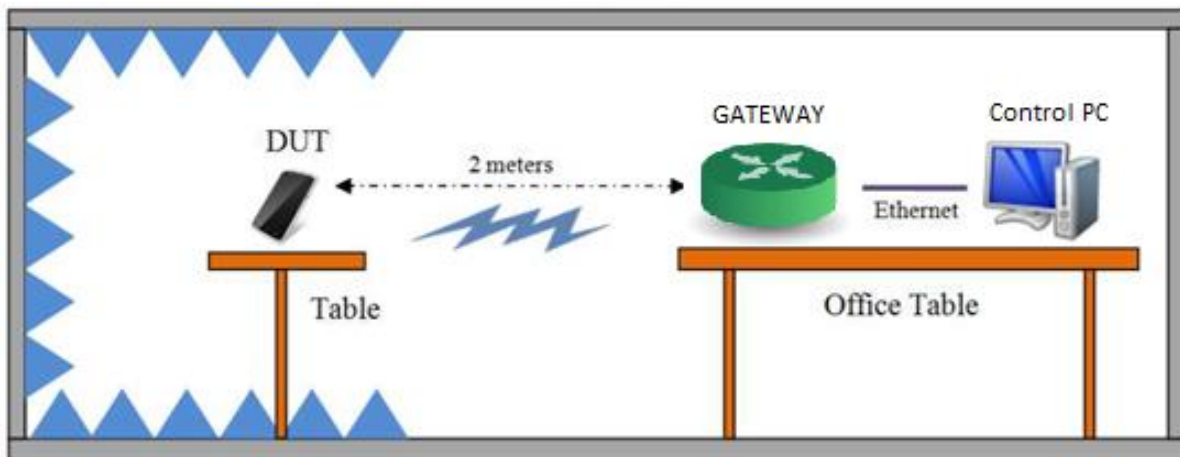
Testing verdicts

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

Test setup

This Test Setup has been used for testing

:



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 (Testing verdicts)
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:	Will be provided via FTP under request

Test Case ID	Description	Date	Verdict	Observations
CLASS A				
TP_A_US915_ED_MAC_104_BV_000 (ABP)	Activation Pre-test		N/A	
TP_A_US915_ED_MAC_104_BV_000 (OTA)	Activation Pre-test	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_001_A	Over The Air Activation	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_001_B	Activation by Personalization		N/A	
TP_A_US915_ED_MAC_104_BV_002	Cryptography	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_003	Downlink Sequence Number	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_004	Confirmed Frames	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_005	DevStatusReq MAC command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_006	NewChannelReq MAC command for Fixed Channel plan devices only	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_007	DIChannelReq for Dynamic Channel plan devices only	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_008	RXParameterSetupReq MAC	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_009	RXTimingSetupReq MAC command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_010	TxParamSetupReq MAC command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_011	LinkCheckReq MAC command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_012_A	LinkADDRReq MAC command (Part 1)	6/3/2024	P	
TP_A_US915_ED_MAC_104_BV_012_B	LinkADDRReq MAC command (Part 2)	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_013	DutyCycleReq MAC Command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_014	DeviceTimeReq MAC Command	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_015_A	RX1 Receive Window Test (Part 1)	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_015_B	RX1 Receive Window Test (Part 2)	5/3/2024	P	
TP_A_US915_ED_MAC_104_BV_016	RX2 Receive Window Test	5/3/2024	P	

TP_A_US915_ED_MAC_104_BV_017	RX1 and RX2 simultaneous frames	5/3/2024	P
TP_A_US915_ED_MAC_104_BV_018	RX Oversized Payload	6/3/2024	P
TP_A_US915_ED_MAC_104_BV_019_A	Maximum Allowed Payload (Part 1)	6/3/2024	P
TP_A_US915_ED_MAC_104_BV_019_B	Maximum Allowed Payload (Part 2)	6/3/2024	P
TP_A_US915_ED_MAC_104_BV_020	MAC Command(s) in App-Payload and/or Frame Options	6/3/2024	P
TP_A_US915_ED_MAC_104_BV_021	Multiple MAC commands prioritization	6/3/2024	P
TP_A_US915_ED_MAC_104_BV_022	FPort 224 Deactivation	6/3/2024	P

Appendix B: ICS

Implementation Conformance Statement (ICS)

Name	Title	Groupname	Mandatory	Value
C_ISM_AS923	DUT works in Asia 923MHz ISM Band	BAND	C	FALSE
C_ISM_AU915	DUT works in Australia 915MHz ISM Band	BAND	C	FALSE
C_ISM_EU868	DUT works in EU 868MHz ISM Band	BAND	C	FALSE
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_RU864	DUT works in Rusia 864MHz ISM Band	BAND	C	FALSE
C_ISM_US915	DUT works in USA 915MHz ISM Band	BAND	C	TRUE
C_CERT_102rB	DUT implements LoRaWAN v1.0.2rB certification requirements	CERT	C	FALSE
C_CERT_104	DUT implements LoRaWAN v1.0.4 certification requirements	CERT	C	TRUE
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_CLASS_C	DUT is a Class C Device (Continuously Listening)	CLASS	C	TRUE
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA)	ED_ACTIVATION	C	TRUE
C_ED_APPLICATION_LAYER_CLOCK_SYN	DUT supports Application Layer Clock	ED_FUOTA	C	FALSE
C_ED_FIRMWARE_MANAGEMENT_PROTOCOL	DUT supports Firmware Management Protocol	ED_FUOTA	C	FALSE
C_ED_FRAGMENTATION_DATA_BLOCK	DUT supports Fragmentation Data Block	ED_FUOTA	C	FALSE
C_ED_FUOTA	DUT supports FUOTA	ED_FUOTA	C	FALSE
C_ED_REMOTE_MULTICAST_SETUP	DUT supports Remote Multicast Setup	ED_FUOTA	C	FALSE
C_ED_SCHC	DUT supports SCHC	ED_SCHC	C	FALSE
C_ED_ADR	DUT supports Adaptive Data Rate (ADR) feature	ED_v1.0.2	C	TRUE
C_ED_ADR_BLOCK	DUT supports LinkADRReq block	ED_v1.0.2	C	TRUE
C_ED_CONFIRMED_FRAME_RETRANSM	DUT supports uplink re-transmissions for	ED_v1.0.2	C	FALSE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED_v1.0.2	C	TRUE
C_ED_JOIN_ISSUES_REMEDIES_100	DUT supports the Lorawan-1.0.x-join-synch-	ED_v1.0.2	C	FALSE
C_ED_RESET	DUT needs a reset after deactivating Test Mode	ED_v1.0.2	C	FALSE
C_ED_TM_TRI	DUT supports Trigger Join Request command in	ED_v1.0.2	C	TRUE
C_ED_AS923_GROUP1	DUT works in Asia 923MHz ISM Band Group 1	ED_v1.0.4	C	FALSE
C_ED_AS923_GROUP2	DUT works in Asia 923MHz ISM Band Group 2	ED_v1.0.4	C	FALSE

C_ED_AS923_GROUP3	DUT works in Asia 923MHz ISM Band Group 3	ED_v1.0.4	C	FALSE
C_ED_AS923_GROUP4	DUT works in Asia 923MHz ISM Band Group 4	ED_v1.0.4	C	FALSE
C_ED_PERMANENT_CLASS_C	DUT permanently enabled Class C	ED_v1.0.4	C	FALSE

Appendix C: Photographs

Front view



Rear view

