

LoRa accredited Test Lab



Test report No:

NIE: 74195RLR.001

Test report

LoRa Alliance End Device Certification Requirements

(*) Identification of item tested	Sonata
(*) Trademark	Watertech S.p.A
(*) Model and /or type reference tested	Sonata LoRa
(*) Other identification of the product	Final HW version: 08.07 Final FW Version: 4B.58
(*) Features	Only OTAA mode, brief description of item tested.
Manufacturer	Watertech S.p.A Address: Passaggio Duomo, 2 Postal code, city: 20123, Milano Country: Italy
Test method requested, standard	Lora Alliance Certification Program
Standard.....:	LoRaWAN v1.0.2
Test Specification.....:	LoRa Alliance End-Device Certification Requirements for EU863-870 V1.6
LoRa_Certification_Questionnaire.....:	LoRaWAN_Certification_Questionnaire_V2.4
Test procedure(s).....:	PELR000_00 LoRa Alliance Testing Procedure
Supported Optional Features	
Adaptive Data Rate (ADR).....:	Yes
SF7BW250.....:	Yes
FSK50	Yes
Summary	IN COMPLIANCE
Approved by (name / position & signature)	Noemí Pérez Dans
Date of issue	2023-03-03
Report template No	FLR001_05 (* "Data provided by the client"

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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.

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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.
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 ("Identification of item tested ", "Trademark", "Model and /or type reference tested", "Derived model not tested", "Other identification of the product", "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: Watertech S.p.A

Sample M/01 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
73901C/001	Sonata Ultrasonic Water Meter	Sonata	WTTA072B22022052	2022-11-15
Firmware version: 4B.58				2022-11-15

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

Sample M/02 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
73901C/002	Sonata Ultrasonic Water Meter	Sonata	WTTA072B22029399	2022-11-15
Firmware version: 4B.58				2022-11-15

2. Sample M/02 has undergone the test(s) specified in subclause "Test method requested".

Sample M/03 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
73785/001	Sonata Ultrasonic Water Meter	Sonata	WTTA072B22024682	2022-11-11
Firmware version: 4B.58				2022-11-11

3. Sample M/03 has undergone the test(s) specified in subclause "Test method requested".

Sample M/04 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
73785/002	Sonata Ultrasonic Water Meter	Sonata	WTTA072B22023682	2022-11-11
Firmware version: 4B.58				2022-11-11

4. Sample M/04 has undergone the test(s) specified in subclause "Test method requested".

Sample M/05 is composed of the following elements:

Control Nº	Description	Model	Serial Nº	Date of reception
73785/003	Sonata Ultrasonic Water Meter	Sonata	WTTA072B22020792	2022-11-11
Firmware version: 4B.58				2022-11-11

5. Sample M/05 has undergone the test(s) specified in subclause "Test method requested".

(*Test sample description

The Sonata is an advanced and highly accurate ultrasonic water meter and data end-point for residential applications. The Sonata's robust design ensures reliable and long-lasting precision. Its technology enables the measurement of even the lowest of flow rates. The Sonata is a data rich end-point, is ready to meet the challenges of tomorrow's smart water networks.

Identification of the client

Watertech S.p.A

Address: Passaggio Duomo, 2
Postal code, City: 20123, Milano
Country: Italy

Testing period and place

Test Location	DEKRA Testing and Certification S.A.U.
Date (start)	2023-02-02
Date (finish)	2023-02-09

Document history

Report number	Date	Description
74195RLR.001	2023-03-01	First release (test report without logs to be uploaded to the public area of LoRa Alliance website)

Remarks and comments

Testing was performed by: Martín Sánchez Revuelta

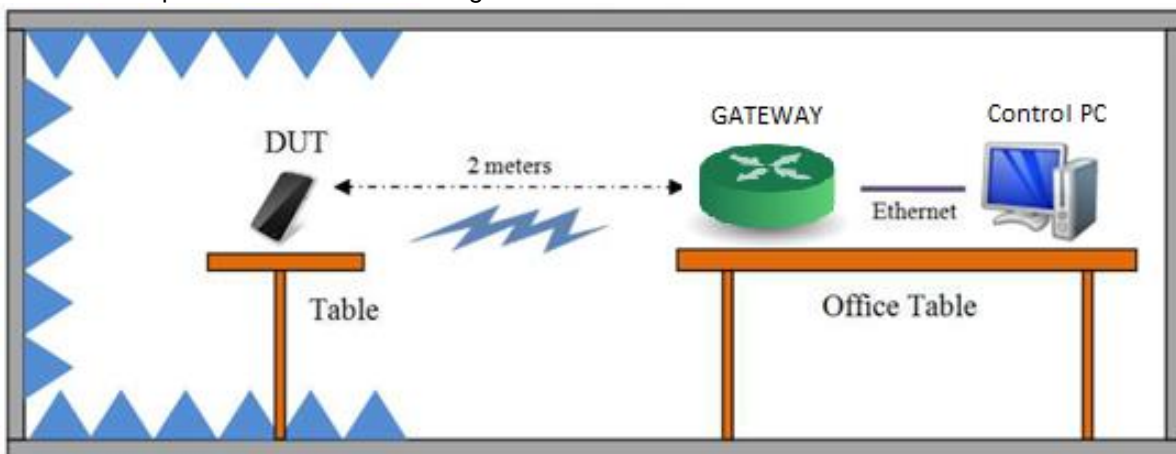
Means of testing identification

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
V2.5.0	3.9.0_R1	Yes	1 x Corecell SX1302C868GW1

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 (<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:	<i>Shared via FTP.</i>

Test Case ID	Description	Date	Verdict	Observations
TP_A_EU868_ED_MAC_BV_000 (ABP)	Device Activation (ABP)	N/A	N/A	
TP_A_EU868_ED_MAC_BV_000 (OTA)	Device Activation (OTA)	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_001_A	Over The Air Activation	09/02/2023 (1)	P	(1) Sample: M01
		17/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		20/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_001_B	Activation by Personalization	N/A	N/A	
TP_A_EU868_ED_MAC_BV_002	Test application functionality	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_003	AES encryption and message integrity	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_004	Downlink error rate	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05

TP_A_EU868_ED_MAC_BV_005	Downlink window timing	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_006	Frame sequence number	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_007	DevStatusReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_008	MAC commands	02/02/2023 (1)	P*	(6) Sample: M01
		16/02/2023 (2)		(7) Sample: M02
		17/02/2023 (3)		(8) Sample: M03
		17/02/2023 (4)		(9) Sample: M04
		20/02/2023 (5)		(10) Sample: M05
				(*) Test Specification mismatch for the executed behavior. Proceed with waiver (ID: 590)
TP_A_EU868_ED_MAC_BV_009	NewChannelReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_010	DIChannelReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_011	Confirmed packets	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_012	RXParamSetupReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_013	RXTimingSetupReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_014_A	LinkADDRReq MAC command (Part 1)	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05

TP_A_EU868_ED_MAC_BV_014_B	LinkADDRReq MAC command (Part 2)	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_015_A	RX1 Receive window test (Part 1)	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_015_B	RX1 Receive window test (Part 2)	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_016	RX2 Receive window test	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_017	RX1 and RX2 simultaneous frames	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_018	TXParamSetupReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_019	LinkCheckReq MAC command	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_020	RX Oversized payload	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05
TP_A_EU868_ED_MAC_BV_021	Maximum Allowed Payload	02/02/2023 (1)	P	(1) Sample: M01
		16/02/2023 (2)		(2) Sample: M02
		17/02/2023 (3)		(3) Sample: M03
		17/02/2023 (4)		(4) Sample: M04
		20/02/2023 (5)		(5) Sample: M05

Appendix B: ICS

Implementation Conformance Statement (ICS)

Sample M01, M02, M03, M04 and M05 have same ICS:

Name	Title	Groupname	Mandatory	Value
C_ISM_AS923	DUT works in Asia 923MHz ISM Band	BAND	-	FALSE
C_ISM_AU915	DUT works in Australia 915MHz ISM Band	BAND	-	FALSE
C_ISM_EU868	DUT works in EU 868MHz ISM Band	BAND	-	TRUE
C_ISM_IN865	DUT works in India 865-867 MHz ISM Band	BAND	-	FALSE
C_ISM_KR920	DUT works in South Korea 920MHz ISM Band	BAND	-	FALSE
C_ISM_RU864	DUT works in Rusia 864MHz ISM Band	BAND	-	FALSE
C_ISM_US915	DUT works in USA 915MHz ISM Band	BAND	-	FALSE
C_CERT_102rB	DUT implements LoRaWAN v1.0.2rB certification requirements	CERT	-	TRUE
C_CERT_104	DUT implements LoRaWAN v1.0.4 certification requirements	CERT	-	FALSE
C_CLASS_A	DUT is a Class A Device (All End Devices)	CLASS	-	TRUE
C_CLASS_B	DUT is a Class B Device (Beacon Mode)	CLASS	-	FALSE
C_CLASS_C	DUT is a Class C Device (Continuously Listening)	CLASS	-	FALSE
C_ED_ADR	DUT supports Adaptive Data Rate (ADR) feature	ED	-	TRUE
C_ED_ADR_BLOCK	DUT supports LinkADRReq block	ED	-	TRUE
C_ED_AS923_GROUP1	DUT works in Asia 923MHz ISM Band Group 1	ED	-	FALSE
C_ED_AS923_GROUP2	DUT works in Asia 923MHz ISM Band Group 2	ED	-	FALSE
C_ED_AS923_GROUP3	DUT works in Asia 923MHz ISM Band Group 3	ED	-	FALSE
C_ED_AS923_GROUP4	DUT works in Asia 923MHz ISM Band Group 4	ED	-	FALSE
C_ED_CONFIRMED_FRAME_RETRANSMIT	DUT supports uplink re-transmissions for Confirmed frames	ED	-	FALSE
C_ED_DL_CHAN	DUT supports DChannelReq MAC command	ED	-	TRUE
C_ED_JOIN_ISSUES_REMEDIES_100	DUT supports the Lorawan-1.0.x-join-synch-issues-remedies-v1.0.0	ED	-	FALSE
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA) mechanism	ED	-	TRUE
C_ED_PERMANENT_CLASS_C	DUT permanently enabled Class C	ED	-	FALSE
C_ED_RESET	DUT needs a reset after deactivating Test Mode	ED	-	FALSE
C_ED_SCHC	DUT supports SCHC	ED	-	FALSE
C_ED_TM_TRI	DUT supports Trigger Join Request command in Test Mode	ED	-	TRUE

Appendix C: Photographs

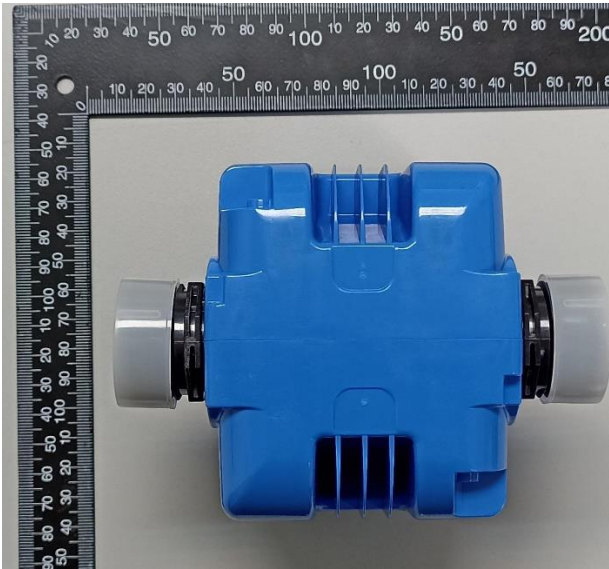
Front view



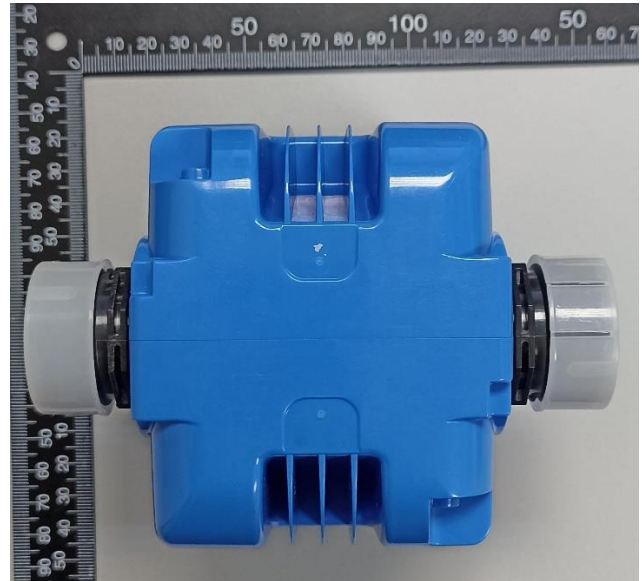


Rear view

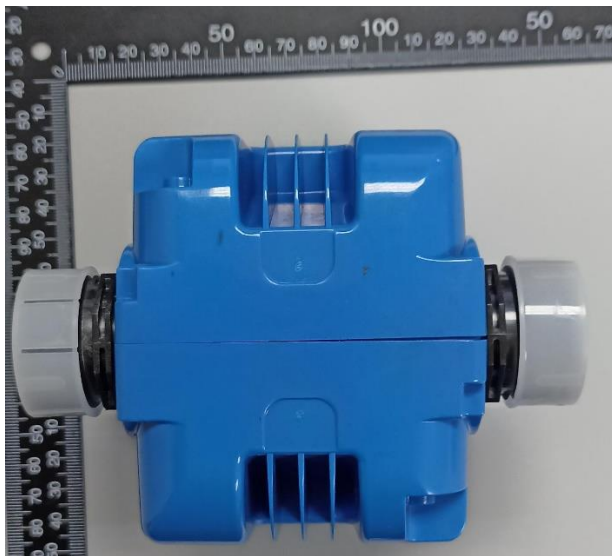
M01:



M02:



M03:



M04:

