

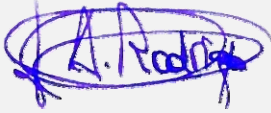


Test report No:

NIE: 201609.003

Test report

LoRa Alliance End Device Certification Requirements

Identification of item tested	50989_Allora_EU868_ABP + 50989_Allora_EU868_OTAA
Trademark	
Model or type reference	Office model
Final HW version	1.1
Final SW version	1.1
Final FW version	2.0 - LoRaMacClassA_office_ABP_20160925_ADR_fix.hex 2.0 - LoRaMacClassA_alloraFactory_office_OTAA_timeout130sec.hex
Features	LoRa Alliance End Device Certification Requirements for EU 868MHz ISM Band Devices
OEM.....	Allora Factory Lijsterlaan 11 2880 BORNEM BELGIUM
Test method requested	Lora Alliance Certification
Standard	LoRa Alliance End Device Certification Requirements for EU 868MHz ISM Band Devices ver1.2
Test procedure(s).....	PELO001_01 TERD-WTS-TP-02 - LORA_TSSTP_PART_1_v1 0
Summary	IN COMPLIANCE
Approved by (name / position & signature)	José Aurelio Rodrigo Simón Wireless Test Solution Manager 
Date of issue	2016-10-03
Report template No	FLO001_01

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Competences and guarantees

AT4 wireless is a testing laboratory competent to carry out the tests described in this report.

In order to assure the traceability to other national and international laboratories, AT4 wireless has a calibration and maintenance program for its measurement equipment.

AT4 wireless 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 AT4 wireless at the time of performance of the test.

AT4 wireless 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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Usage of samples

Samples undergoing test have been selected by: Allora Factory.

Sample M/01 is composed of the following elements:

Control N°	Description	Model	HW version	SW version	FW version	Serial N°	Date of reception
50989/1	Product package						2016-08-30
50989/2	ST-Link Programmer package						2016-08-30
50989/3.1	End-Device	Allora Office	1.1	1.1	2.0 - LoRaMacClassA_ office_ABP_20160925_ ADR_fix.hex		2016-08-30
50989/4	ST-Link Programmer		V2			B 2015 06	2016-08-30
50989/5	USB cable						2016-08-30
50989/6	Programmer cable						2016-08-30
50989/7	AA battery						2016-08-30

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 N°	Description	Model	HW version	SW version	FW version	Serial N°	Date of reception
50989/1	Product package						2016-08-30
50989/2	ST-Link Programmer package						2016-08-30
50989/3.2	End-Device	Allora Office	1.1	1.1	2.0 - LoRaMacClassA_ alloraFactory_office_ OTAA_timeout130sec.hex		2016-08-30
50989/4	ST-Link Programmer		V2			B 2015 06	2016-08-30
50989/5	USB cable						2016-08-30
50989/6	Programmer cable						2016-08-30
50989/7	AA battery						2016-08-30

1. Sample M/02 has undergone the test(s) specified in subclause “Test method requested”.

Test sample description

The test sample M/01 consists on 50989/3.1 which is the hardware 50989/3 programmed with FW labeled as:

“2.0 - LoRaMacClassA_office_ABP_20160925_ADR_fix.hex”

And the test sample M/02 consists on 50989/3.2 which is the hardware 50989/3 programmed with FW labeled as:

“2.0 - LoRaMacClassA_alloraFactory_office_OTAA_timeout130sec.hex”

The allora Office Sensor combines an accurate Temperature sensor (Celsius Air), a relative Humidity sensor (Humidi), an ultra-low power PIR occupancy sensor (Pirio), a push button with led feedback interface (PushIO), analog and digital inputs (optional CO2), serial interface and I2C connected sensor interface.

Identification of the client

Allora Factory

Lijsterlaan 11

2880 BORNEM

BELGIUM

Contact person:

Pieter De Mil

pieter@alloraFactory.com

+32 479 44 58 58

Testing period

The performed test started on 2016-09-29 and finished on 2016-09-30.

The tests have been performed at AT4 wireless (Spain).

Environmental conditions

The testing has been performed within the following limits:

Temperature	Min. = 15 °C Max. = 35 °C
Relative humidity	Min. = 20 % Max. = 80 %

Remarks and comments

The tests have been performed by the technical personnel:

Diego Bartolome

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Testing verdicts

As detailed in Appendix A.

Means of testing identification

Following equipment was used to perform the testing:

Test System	TACS4 LORA		
Control Number	5866		
Hardware	Control No.	Equipment	Serial No.
		Semtech Gateway IOT SX1301 Starter Kit	PCB_E340V02A 0915
Software:	TACS4 LORA GUI v1.5.0 TACS4 LORA Reporting Module v1.3.0 TACS4 LORA Tecnology Package v2.2.0_R1 TACS4 LORA ED Certification EU v1.2		

Appendix A – Test result

Test campaign report

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

- Test Case ID: Test case identifier, as it can be found on the referred standard.
- Description: Test case description, as it can be found on the referred standard.
- Date: Date of the beginning of the execution.
- Verdict: Records the verdict assigned to each Test Case run to completion. Following verdicts are possible:
 - Pass:** If the Test Case passed.
 - Fail:** If the Test Case failed.
 - Inconclusive.** The test case did not reach a Pass or Fail verdict.
 - NA:** Not applicable.
 - NM:** Not measured.

Observations: Provides a reference to additional information relevant to the test (when required).

Test Case ID	Description	Date	Verdict	Observations
TP_A_EU868_ED_MAC_BV_000	Device activation	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_001	Test application functionality	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_002	Over The Air activation	2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_003	Packet Error Rate Part 1	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_004	AES encryption and message integrity	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_005	Downlink window timing	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_006	Frame sequence number	2016-09-29	PASS	ABP
		2016-09-29	PASS	OTAA
TP_A_EU868_ED_MAC_BV_007	DevStatusReq MAC command	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_008	MAC Commands	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_009	NewChannelReq MAC command	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_010	Confirmed packets	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_011	RXParamSetupReq MAC command	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_012	RXTimingSetupReq MAC command	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_013	LinkADRReq MAC command	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA

TP_A_EU868_ED_MAC_BV_014	Packet Error Rate RX1	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA
TP_A_EU868_ED_MAC_BV_015	Packet Error Rate RX2	2016-09-29	PASS	ABP
		2016-09-30	PASS	OTAA

Conclusions

All applicable Test Cases have a PASS final verdict in both configurations: ABP and OTAA.

Appendix B – ICS

Implementation Conformance Statement

The ICS set for this DUT is consistent with the static conformance requirements in the referenced test specification. The qualified ICS and IXIT menus of the test system were defined in accordance with the client.

ABP

Item	ICS Description	Supported [Yes/No]
C_CLASS_A	DUT is a Class A Device (All End Devices)	Yes
C_ISM_EU868	DUT works in EU 868MHz ISM Band	Yes
C_ED_ADR	DUT supports Adaptive Data Rate (ADR) feature	Yes
C_ED_TM_TRI	DUT supports Trigger Join Request command in Test Mode	Yes

OTAA

Item	ICS Description	Supported [Yes/No]
C_CLASS_A	DUT is a Class A Device (All End Devices)	Yes
C_ISM_EU868	DUT works in EU 868MHz ISM Band	Yes
C_ED_ADR	DUT supports Adaptive Data Rate (ADR) feature	Yes
C_ED_OTAA	DUT supports Over-The-Air Activation (OTAA) mechanism	Yes

Appendix C – IXIT

Implementation eXtra Information for Testing

ABP

Item	IXIT Description	Value
I_ABP_APPSKEY	Application session key (AppSKey)	'AF0FF1CE00AF00C0DE00F00D00CAFE00'O
I_ABP_NWKSKEY	Network session key (NwkSKey)	'0FF1CE00AF00C0DE00F00D00CAFE00AF'O
I_OTAA_APPKEY	Application key (AppKey)	'A19616E867B13981AC25FEA24B4F1346'O
I_ED_APPEUI	Application identifier (AppEUI)	'0100FF1FEED5B370'O
I_ABP_ADDR	End-device Address (DevAddr)	'E01CFF00'O

OTAA

Item	IXIT Description	Value
I_ABP_APPSKEY	Application session key (AppSKey)	'00000000000000000000000000000000'O
I_ABP_NWKSKEY	Network session key (NwkSKey)	'00000000000000000000000000000000'O
I_OTAA_APPKEY	Application key (AppKey)	'AF0FF1CE00AF00C0DE00F00D00CAFE01'O
I_ED_APPEUI	Application identifier (AppEUI)	'70B3D5EE1FFFFFF'O
I_ABP_ADDR	End-device Address (DevAddr)	'00000000'O

Appendix D – Photographs

Samples M/01 and M/02

