Version V5.0.0 , Compatible with all RSA V3.0.x

June 11, 2020

Sigfox RF & Protocol Test Procedure

Public Use

IMPORTANT NOTICE

The device proposed in Sigfox RF & Protocol Tests has to be representative of the ones present in the field.

To succeed in your Sigfox RF & Protocol Tests , you need to :

- Read carefully the Radio_Signal_Analyzer User Guide (available on Build Website: *https://build.sigfox.com*).
- Have a Sigfox Checklist (available on Build Website: *https://build.sigfox.com*) properly filled in (all information in the checklist will be used all tests long).
- Have a UUT which integrates the latest version of the Sigfox Test Mode (refer to the "Sigfox RF & Protocol Test Specification", available on Build Website: *https://build.sigfox.com*)

Contents

1 Introduction

This document describes the test procedure compliant with the Sigfox RF & Protocol Test Plan .

1.1 Scope

This document is delivered to Device Makers to help them execute Sigfox tests before the official Sigfox RF & Protocol Tests .

1.2 Acronyms and abbreviations

- **AES**: Advanced Encryption Standard
- **CS**: Carrier Sense
- **Cold Test**: Test executed in initial condition (wait till the UUT come back to the initial system between two tests)
- **DBPSK**: Differential Binary Phase-Shift Keying
- **Duty Cycle**: part of a period in which a signal is active (high state/Period)
- **ENC**: Encrypted
- **Legacy Uplink**: initial payload format of Sigfox Uplink without encryption
- **LBT**: Listen Before Talk
- **NVM**: Non Volatile Memory
- **RC**: Radio Configuration
- **RF**: Radio Frequency
- **RSA**: Radio_Signal_Analyzer
- **SMIQ**: Vector Signal Generator
- **Sigfox Message**: Three frames with payload 4041424344454647484 94A4B
- **UUT**: Unit Under Test (Device, Modular Design or Devlopment Solution)

1.3 Radio_Signal_Analyzer

1.3.1 User guide

Before starting test, read carefully the Radio_Signal_Analyzer User guide (available on Build Website: *https://build.sigfox.com*), it will be easier to use Radio_Signal_Analyzer and to find all things after that.

1.3.2 Verdict Type

EVALUATION	All requirements are **manual verdict** and have to be updated by the operator. Check each "Covered requirement" table to know the manual verdict and the "Manual Verdict" explanation to know if this verdict is "FAILED" or "PASSED".
TOOL-ANALYSIS	All requirements are **automatic verdict** and will be updated automatically by Radio_Signal_Analyzer .
MEASUREMENT	All measurement are **automatic** and will be updated automatically by RSA.

1.3.3 Checklist Information

All information from the checklist have to be filled in properly before starting test.

Radio_Signal_Analyzer should be configured according to the *RF & Protocol Test Guide* (RCx, modem type, ID/KEY values, ...) provided by the Device Maker. Some information **will be needed all test long**.

1.3.4 SDR Dongle limitations

Some requirement cannot be validated with the SDR DONGLE as it is not calibrated in Power Level/ Frequency. With this equipment do not forget to keep a safe margin for all tests. All verdicts "inconclusive" (due to SDR DONGLE) have to be tested following the Sigfox Test Plan (available on Build Website: *https://build.sigfox.com*).

1.3.5 Launch Radio_Signal_Analyzer

1. Fill in all following information :
   - Fill in all *UUT* information in "Info / Equipment / Verdicts" window ("Information" subwindow)
   - Fill in all equipment information according to your setup in "Info / Equipment / Verdicts" window ("Equipment" subwindow), or load your equipment information file (if already saved)
2. Configure the "Device Configuration" window, (**This Configuration should not be modified after starting Sigfox RF & Protocol Tests** otherwise all RSA results will be reset)
   - UUT must integrates the latest version of the Sigfox Test Mode, if the UUT is not in this case, **update your device first** refer to the Appendix explanations
   - ID/KEY : if you have operational ID/KEY and don't know the private KEY value (refer to the Appendix explanations)

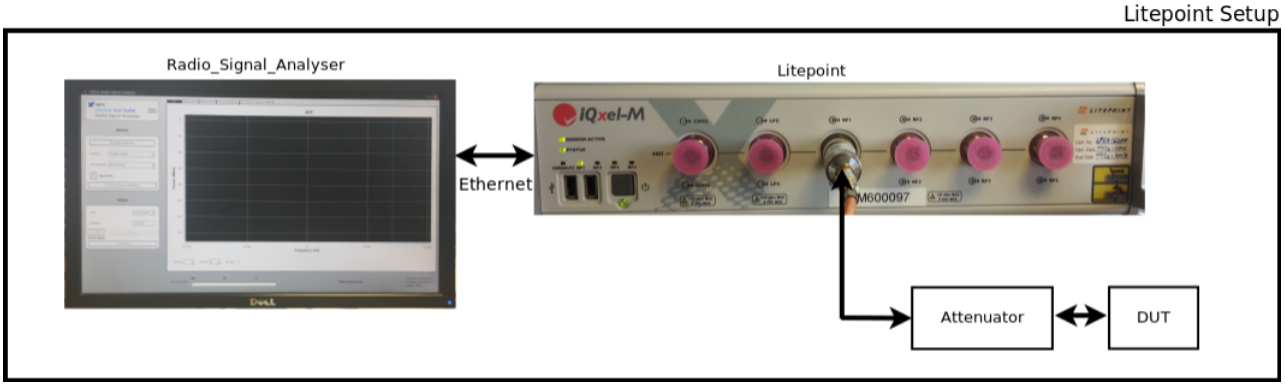
RSA will automatically update the test list according to the option selected in Device Configuration.
If a test mentionned in the following Sigfox RF & Protocol Test Procedure is not in the RSA test list, continue with the next test.

2 Sigfox RF & Protocol Tests

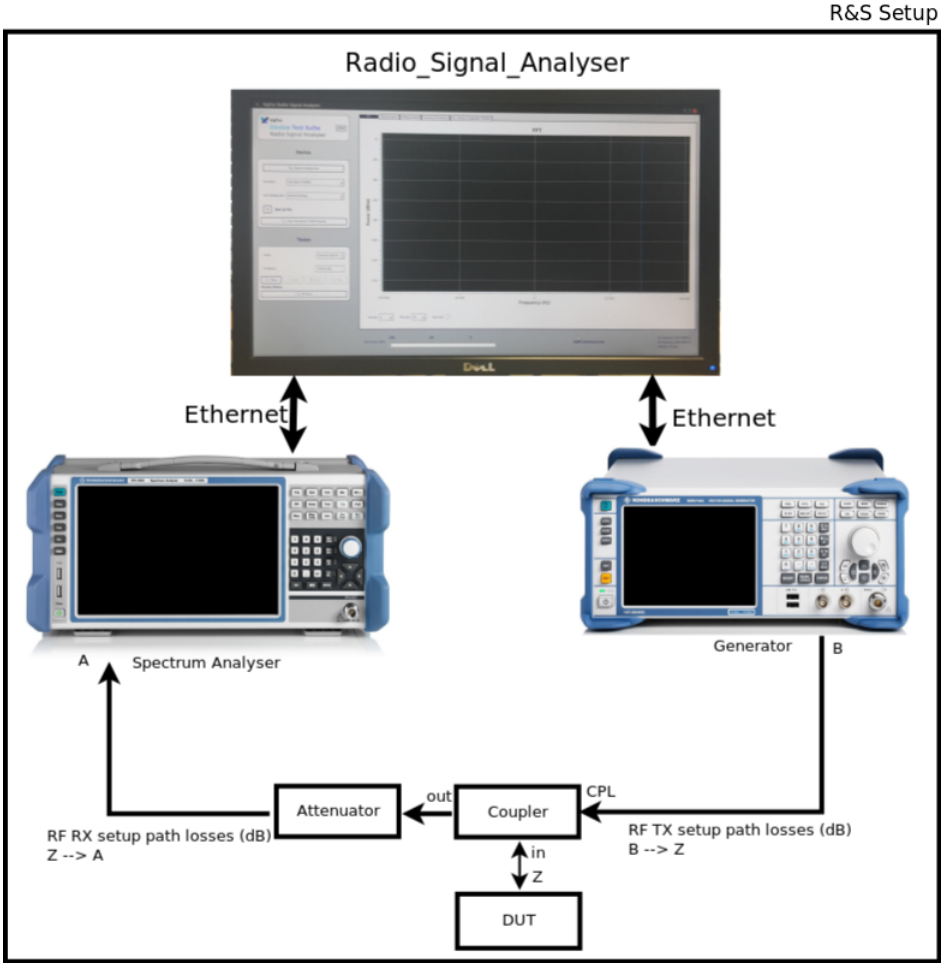
2.1 Test Setup

Litepoint and R&S setup :

Litepoint Setup



R&S Setup

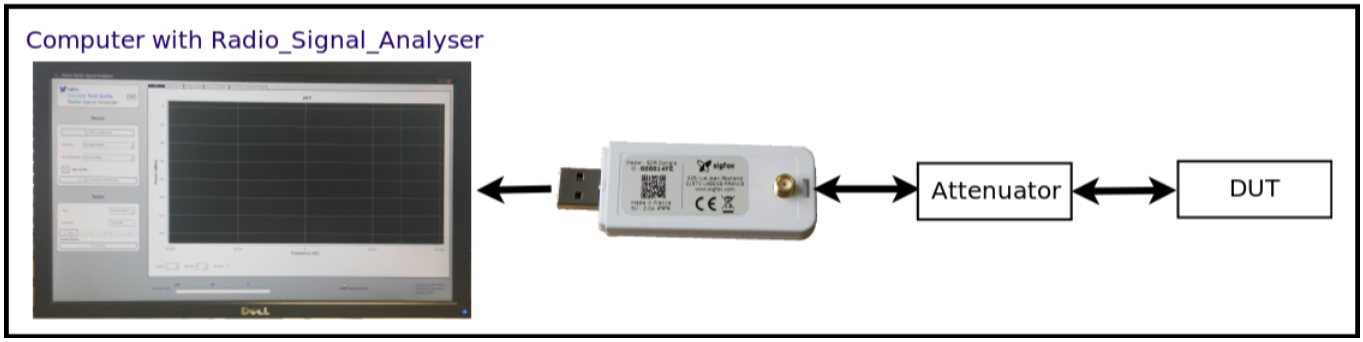


Test Setup :

- Measure cable path losses of the setup
- Connect the UUT to the Lab proper equipment
- Select your equipment in the "Tester" part and configure the proper IP address (see User Manual of the equipment)
- Click "Open"
- Open "RF Setup" and set the path loss "RF Rx/Tx Setup Losses (dB)" or "RF Rx Setup losses (dB)" and "RF Tx Setup losses (dB)" field : i.e : 31 for 30dB external attenuation + 1dB cable losses

SDR Dongle setup :

SDR Dongle Setup



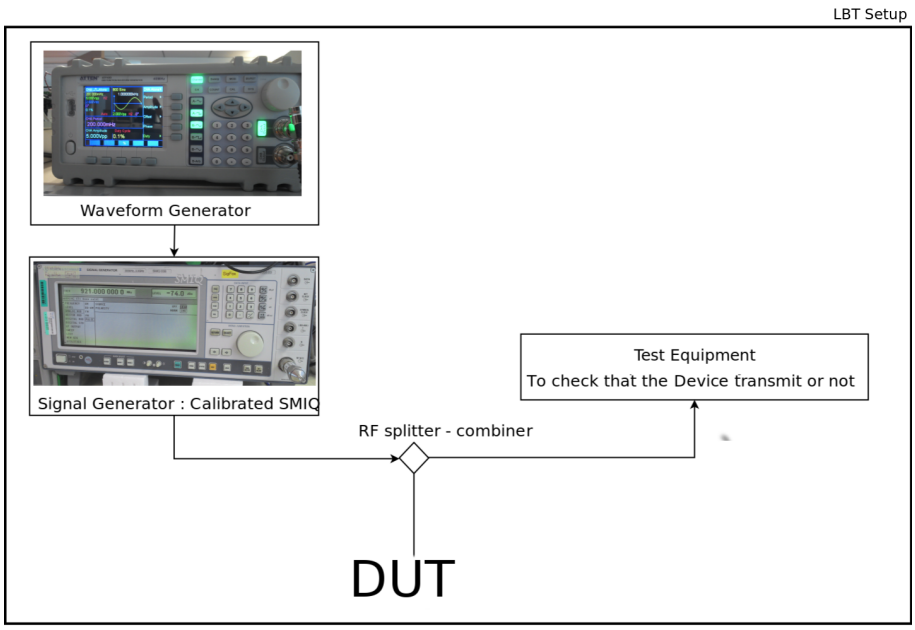
Test execution :

- Connect UUT to SDR-DONGLE with 40dB attenuator
- Select "SDR DONGLE" in the "Tester" part
- Click "Open"
- Click "Start"

Some requirements cannot be validated as the SDR DONGLE is not calibrated in frequency and power level (as RSSI level), we recommand to keep a safe margin.

Keep a margin on timings (middle of the allowed timings) as the measurement with the SDR-DONGLE is not really accurate.

LBT setup :



LBT Test Setup : This test setup has to be used only for LBT tests

- Configure the signal generator at -40dBm at the center uplink frequency of the RCx under test (923.2MHz for RC3 or 923.3MHz for RC5).
- Configure the Waveform Generator (with fixed high state = 10.2s) according to the Carrier Sense value :
  - Period = (10.2s + (CS_value_in_s + 0.001)) s
  - Duty Cycle = (10.2 / Period) * 100 %
- Connect the signal generator, the Waveform Generator and the Litepoint/R&S/SDR Dongle to the UUT through a Combiner

2.2 Tests Execution

ADJUSTABLE RF OUTPUT POWER :

If the device proposed in Sigfox RF & Protocol Tests has the option to change the RF output power the Sigfox RF & Protocol Tests has to be done twice :

- Once at minimum RF output power configured in the *UUT* (the whole Sigfox RF & Protocol Test Procedure has to be followed with this configuration) .
- Second time at maximum RF output power configured in the *UUT* (the whole Sigfox RF & Protocol Test Procedure has to be followed with this configuration) .

Two Sigfox RF & Protocol Tests reports will be provided for this *UUT* .

2.2.1 UL-RF Analysis

TEST CONDITION

Cold tests have to be done to validate all RF requirements, the goal is to validate the device in worst condition (before established system) .

2.2.1.a Test UL-RF Analysis Minimum Voltage

Test execution :

- Ensure that your *UUT* is in **cold test condition (Remove all USB cables and power supply)**
- Select "UL - RF Analysis Minimum Voltage" in "Test" drop-down menu
- Power up the *UUT* in Minimum Voltage
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode C** (TX-BPSK in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.1.b Test UL-RF Analysis Maximum Voltage

Test execution :

- Ensure that your *UUT* is in **cold test condition (Remove all USB cables and power supply)**
- Select "UL - RF Analysis Maximum Voltage" in "Test" drop-down menu
- Power up the *UUT* in Maximum Voltage
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode C** (TX-BPSK in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.1.c Test UL-RF Analysis Nominal Voltage

Test execution :

- Ensure that your *UUT* is in **cold test condition (Remove all USB cables and power supply)**
- Select "UL - RF Analysis Nominal Voltage" in "Test" drop-down menu
- Power up the *UUT* in Nominal Voltage

- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Click "Raw IQ File" to start the record in the "Configuration" part **in case of Litepoint or R&S, skip this line**
- Choose a folder to save the record
- Run **The Test Mode C** (TX-BPSK in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for the end of the *UUT* Test mode
- Click "Raw IQ File" again to stop the record and check the record size (value should be different from 0 MB) **in case of Litepoint or R&S, skip this line**
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

Keep the UUT in Nominal Voltage till the end.

2.2.2 Test DL-GFSK Receiver

The "static Drift (Hz)" will be updated automatically by RSA according to **The Test Mode C** (TX-BPSK in the last Sigfox ADDON RF & PROTOCOL) static drift result.

Test execution :

- Select "DL-GFSK Receiver" in "Test" drop-down menu
- Set the Downlink level : -100 dBm **in case of SDR Dongle, skip this line**
- Click "Start Send GFSK" in "Configuration" part
- Run **The Test Mode D** (RX-GFSK in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Check the GFSK reporting
- Wait for the end of the *UUT* test mode and update the verdict
- Click "Stop Send GFSK" in "Configuration" part

The RX-GFSK level cannot be validated with the SDR-DONGLE (fixed level) but this test allows to validate the test mode RX-GFSK functionality.

Manual Verdict :

- 2GFSK 600bps : This test is PASSED only if the *UUT* receives GFSK sent by Radio_Signal_Analyzer and reports the test result.

2.2.3 Test UL-Protocol

Test execution :

- Select "UL-Protocol" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode J**(TX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.4 Test UL-Protocol Encrypted Payload

Test execution :

- Select "UL - Protocol Encrypted Payload" in "Test" drop-down menu
- Switch your device in encrypted mode
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode J**(TX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).
- **Switch your device in not-encrypted mode**

2.2.5 Test UL-Non Volatile Memory

Test execution :

- Select "UL - Non Volatile Memory" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode L** (NVM in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for the end of the *UUT* Test mode
- **Power down (remove all USB cables and power supply)** the *UUT*
- **Power up** the *UUT* in Nominal Voltage
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode L** (NVM in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for the end of the *UUT* Test mode
- **Power down (remove all USB cables and power supply)** the *UUT*
- **Power up** the *UUT* in Nominal Voltage
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode L** (NVM in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.6 Test UL-Public Key

Test execution :

- Select "UL - Public Key" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode K** (PUBLIC-KEY in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for the end of the Sigfox message
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.7 Test UL-Frequency Distribution

Test execution :

- Select "UL - Frequency Distribution" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode B** (TX-FREQ-DISTRIBUTION in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.8 Test UL-Repeat Timeout

Read the following procedure carefully before starting your test. If this procedure is not followed, RSA could crash and previous test results get lost.

1. **Litepoint and R&S Procedure :**

   Test execution :

   To know the applied interframe, get back the TX interframe in "Info / Equipment / Verdicts" window ("verdicts" subwindow) :

   - Description name "TX Interframe Timing in Uplink mode"
   - Value in Result2 column

   (a) **TX interframe $\geq$ 1s:**

   - Click "Close" in "Tester" part
   - Change "Tester" to SDR DONGLE

- Click "Open" and "Start" in "Tester" part
- Connect the LBT test setup (with blocker)
- Start the blocker
- Select "UL - Repeat Timeout" in "Test" drop-down menu
- Run **The Test Mode G** (TX-BIT in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).
- Click "Stop" and "Close" in "Tester" part
- Change "Tester" to the previous one
- Connect the test setup (without blocker) again
- Click "Open" and continue this procedure

(b) **TX interframe < 1s:**

- Connect the LBT test setup (with blocker)
- Start the blocker
- Select "UL - Repeat Timeout" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode G** (TX-BIT in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).
- Connect the test setup (without blocker) again

2. **SDR Dongle Procedure :**

Test execution :

- Connect the LBT test setup (with blocker)
- Start the blocker
- Select "UL - Repeat Timeout" in "Test" drop-down menu
- Run **The Test Mode G** (TX-BIT in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).
- Connect the test setup (without blocker) again

2.2.9 Test UL-Frequency Synthesis

Test execution :

- Select "UL - Frequency Synthesis" in "Test" drop-down menu
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode A** (TX-SYNTH in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.10 Test DL-Protocol

Test execution :

- Select "DL-Protocol" in "Test" drop-down menu
- Set the Downlink level : -80 dBm **in case of SDR Dongle, skip this line**
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode F** (RX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for the end of the *UUT* Test mode
- Set the Downlink level : -100 dBm **in case of SDR Dongle, skip this line**
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode F** (RX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

Both results need to be passed for final verdict, but only the last measurement is reported in RSA result column.

2.2.11 Test DL-Protocol Encrypted Payload

Test execution :

- Select "DL-Protocol Encrypted Payload" in "Test" drop-down menu
- Switch your device in encrypted mode
- Set the Downlink level : -100 dBm **in case of SDR Dongle, skip this line**
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode F** (RX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).
- **Switch your device in not-encrypted mode**

2.2.12 Test DL-Start Of Listening Window

Test execution :

- Select "DL-Start Of Listening Window" in "Test" drop-down menu
- Set the Downlink level : -100 dBm **in case of SDR Dongle, skip this line**
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode F** (RX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.13 Test DL-End Of Listening Window

Test execution :

- Select "DL-End Of Listening Window" in "Test" drop-down menu
- Set the Downlink level : -100 dBm **in case of SDR Dongle, skip this line**
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode F** (RX-PROTOCOL in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.14 Test DL-Link Budget

RSA computes automatically the Downlink level according to the output power value.
Do not modify the Downlink level after starting the test (the verdict will become fail).

Test execution :

- Select "DL - Link Budget" in "Test" drop-down menu
- Check if the link budget value has been updated properly (value should be different from 0)
- Click "Start" in "Tester" part **in case of SDR Dongle, skip this line**
- Run **The Test Mode E** (RX-SENSI in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

The sensitivity cannot be validated with the SDR-DONGLE (fixed level) but this test allows to validate the test mode RX-SENSITIVITY functionality.

2.2.15 Monarch Tests

The following part (Monarch test) is not available on SDR DONGLE.

2.2.15.a Test Monarch-Beacon At High Level

Test execution :

- Select "MONARCH-Beacon At High Level" in "Test" drop-down menu
- Click "Start" in "Tester" part
- Run **The Test Mode H** (RX-MONARCH-BEACON in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.15.b Test Monarch-Interferer At High Level

Test execution :

- Select "MONARCH-Interferer At High Level" in "Test" drop-down menu
- Click "Start" in "Tester" part
- Run **The Test Mode H** (RX-MONARCH-BEACON in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.15.c Test Monarch-Interferer At Low Level

Test execution :

- Select "MONARCH-Beacon At Low Level" in "Test" drop-down menu
- Click "Start" in "Tester" part
- Run **The Test Mode H** (RX-MONARCH-BEACON in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

2.2.15.d Test Monarch-Link Budget

The Test UL-RF Analysis Nominal Voltage has to be executed before this test.

Test execution :

- Select "MONARCH - Link Budget" in "Test" drop-down menu
- Click "Start" in "Tester" part
- Run **The Test Mode I** (RX-MONARCH-SENSI in the last Sigfox ADDON RF & PROTOCOL) with your *UUT*
- Wait for a final stream status (final verdict available) and stop the UUT test mode (if needed).

3 Export Results

Be careful, when saving the measurement, the result folder will be cleared.
Be careful, if the LED is orange in the export result window, results are missing for a full official test report.

For all manual verdicts, **add a note and/or a value** in the comment part.
If the manual verdict is fail, **add a note** in the comment part **to explain why** (for example : The command doesn't work).

Export results **when all requirements have been tested** (all verdicts should be "FAIL" , "INFO" or "PASS") :

- In "Info / Equipment / Verdicts" window, Choose "Export Results"
- Select the result folder
- Select your *UUT* picture
- Select the I/Q record
- Select the *RF & Protocol Test Guide*

The sigfoxrfandprotocol.tar.gz will contain all information (verdicts, comments, information) and **shouldn't be modified in any way**. **Be careful**, With the SDR Dongle, all verdicts : "INCONCLUSIVE" , cannot be validate (due to the equipment's limitation).

4 APPENDIX

4.1 How to configure RSA if you don't know the private key ?

This specific test setup is applicable only in case of old library and is not recommended as operational mode cannot be fully validated.

Configure RSA without Private KEY value if operational ID/KEY

The device proposed in Sigfox RF & Protocol Tests must have ID/KEY test values. However if the device cannot be configured in test credentials, it's possible to test in public KEY :

- Switch the *UUT* in public KEY
- In "Device Configuration" Replace the default ID value by your operational ID value
- In "Device Configuration" Replace the default KEY value by 0x00112233445566778899AABBCCDDEEFF

4.2 Tests and Covered Requirements

All test mode are described in the Sigfox RF & Protocol Specifications . The UUT must be compliant with the last Sigfox RF & Protocol Specifications with all test mode up-to-date

Spec Number	Requirement	Test	Test Mode
PRS-RFP-001	Spectral Occupation Products Population	Test UL-Frequency Synthesis	A
PRS-RFP-002	Operational Frequencies Range	Test UL-Frequency Distribution	B
PRS-RFP-003	Operational Frequencies Distribution	Test UL-Frequency Distribution	B
PRS-RFP-004	Static Frequency Tolerance	Test UL-RF Analysis	C
PRS-RFP-010	DBPSK Modulation	Test UL-RF Analysis	C
PRS-RFP-011	Phase Measurement	Test UL-RF Analysis	C
PRS-RFP-012	Extra symbols before the first Sigfox bit of the frame	Test UL-RF Analysis	C
PRS-RFP-013	Extra symbols after the last Sigfox bit of the frame	Test UL-RF Analysis	C
PRS-RFP-014	TX Max Symbol duration	Test UL-RF Analysis	C
PRS-RFP-015	Max TX Baudrate Cumulated Error	Test UL-RF Analysis	C
PRS-RFP-016	Power Spectral Density For Class 0 And 1	Test UL-RF Analysis	C
PRS-RFP-017	Power Spectral Density For Class 2 And 3	Test UL-RF Analysis	C
PRS-RFP-018	Transitional Frequency Dynamic Drift	Test UL-RF Analysis	C
PRS-RFP-019	Established Frequency Dynamic Drift	Test UL-RF Analysis	C
PRS-RFP-020	2GFSK 600bps	Test DL-GFSK Receiver	D
PRS-RFP-021	Sigfox Link Budget	Test DL-Link Budget	E
PRS-RFP-030	AES	Test UL-Protocol	J
PRS-RFP-031	Frequency Storage	Test UL-Non Volatile Memory	G
PRS-RFP-032	Message Counter Storage	Test UL-Non Volatile Memory	G

Spec Number	Requirement	Test	Test Mode
PRS-RFP-033	Public Key switch	Test UL-Public Key	K
PRS-RFP-034	Number of frames per message in Uplink mode	Test UL-Protocol	J
PRS-RFP-035	Legacy Uplink	Test UL-Protocol	J
PRS-RFP-036	Uplink Encrypted payload	Test UL-Protocol Encrypted Payload	J
PRS-RFP-037	Downlink Legacy	Test DL-Protocol	F
PRS-RFP-038	Downlink Encrypted Payload	Test DL-Protocol Encrypted Payload	F
PRS-RFP-039	RSSI level	Test DL-Protocol	F
PRS-RFP-040	Number of Uplink frame in bi-directional mode	Test DL-Protocol	F
PRS-RFP-041	Carrier center frequencies in bi-directional mode	Test DL-Protocol	F
PRS-RFP-050	TX Interframe Timing in Uplink mode	Test UL-Protocol	J
PRS-RFP-051	TX repeat timeout	Test UL-Repeat Timeout	G
PRS-RFP-052	TX Interframe Timing in Bi-directional mode	Test DL-Protocol	F
PRS-RFP-053	RX Start Of Listening	Test DL-Start Of Listening Window	F
PRS-RFP-054	RX End Of Listening	Test DL-End Of Listening Window	F
PRS-RFP-055	RX to Confirmation Control Message Timing	Test DL-Protocol	F
PRS-RFP-060	RC determination from Monarch signal at High power level	Test Monarch-Beacon At High Level	H
PRS-RFP-061	Link Budget on Monarch signal	Test Monarch-Link Budget	I
PRS-RFP-062	Robustness to High Power Level interferer for Monarch signal	Test Monarch-Interferer At High Level	H
PRS-RFP-063	Robustness to Low Power Level interferer for Monarch signal	Test Monarch-Interferer At Low Level	H
PRS-RFP-070	Modulated Conducted Output Power	Test UL-RF Analysis	C
PRS-RFP-071	UUT Temperature level	Test UL-Protocol	J
PRS-RFP-072	UUT Voltage level	Test UL-Protocol	J
PRS-RFP-073	I/Q Wave record	Test UL-RF Analysis	C