

RTX2254

Bluetooth RF Tester

Stand-alone Unit



Quick Installation Guide

Version: 1.11 PBB/MVC 2019.03.19



TABLE OF CONTENTS

1	INTRODUCTION	3
2	WORD AND ABBREVIATION LIST	4
3	HARDWARE INSTALLATION PROCEDURE	5
3.1	Connection Overview	5
3.2	Installation	6
4	SOFTWARE INSTALLATION PROCEDURES	7
4.1 4 4 4 4 4	Software Installation File #1 1.1 RTX2254 Bluetooth RF Tester Software Installation 1.2 Drivers Installation 1.3 RTX EAI Port Server Installation 1.4 UART Bridge Driver Installation 1.5 Microsoft Drivers Installation	7 7 10 11 13 15
4.2 4	Software Installation File #2 .2.1 RTX Demo Software Installation	16 16
5	SOFTWARE CONFIGURATION	17
5.1 5 5	Configuration of RTX EAI Server .1.1 Find the COM Port to use .1.2 Setup the RTX EAI Server	17 17 19
6	THE FIRST TEST	22
6.1	Set-up of HW for First Test	22
6.2 6 6 6	Set-up of SW for First Test .2.1 Select DUT Test Protocol .2.2 Setup COM Ports .2.3 Setup DUT for Test	23 25 26 27
6.3	Starting the Test	28
7	SAFETY INFORMATION	30
7.1	General	30
7.2	Electrostatic Discharge	30
7.3	High Voltage	30



1 Introduction

The **RTX2254 Bluetooth RF Tester** is a highly-optimized, automated test solution for calibration and functional test in the production of wireless Bluetooth Low Energy (BLE) devices.

This quick installation guide will describe the hardware and software installation procedures for the **RTX2254 Bluetooth RF Tester** – Stand-alone unit, the configuration and the first test.

Please note that: A test DUT must be available to complete this quick installation guide.

The DUT must be setup for production test (DTM) with either HCI or 2-Wire interface. A "Test DUT" with USB is used as example in this description.



RTX2254 with "Test DUT" on USB

Please note that:

RTX2254 is available as a single ported tester for one DUT (RTX no. 95101347) or as a dual ported tester for two DUTs (RTX no. 95101348).



2 Word and Abbreviation List

The following words and abbreviations are used in this document:

- Bluetooth SIG specified test protocol where only Tx, Rx and GND is 2-Wire . used and 16-bit commands and events
- API Application programming interface
- BER Bit Error Rate • Bluetooth low energy
- BLE .
- BΤ Bluetooth
- BTLE Bluetooth low energy .
- COM Serial communication port referred to by a number .
- **Continuous Waveform** CW
- Dynamic Link Library DLL
- SW that interfaces to a HW unit . Driver
- DTM Direct Test Mode, see Bluetooth test specification
- Device Under Test DUT .
- EAI **Enterprise Application Integration** .
- ESD Electro-Static Discharge
- . GND Ground
- Graphical User Interface GUI .
- Host Controller Interface HCI
- НW Hardware
- Identification . ID
- IRR Inquiry response rate
- Industrial Scientific and Medical ISM •
- Link Layer . LL
- LO Link Ouality
- MAC Media access control .
- Personal Computer PC .
- PDU Protocol data unit
- PER Packet Error Rate
- A smaller frame shown in windows Pop-Up .
- PPM Part Per Million •
- RF Radio frequency
- RS232 Serial port with +-12V signaling .
- Received Signal Strength • RSS
- Received signal strength indicator . RSSI
- Test system with shielding, fixture and test HW RTX2300 .
- Rx Receive
- Special interest group for BT SIG .
- Software (Programs) SW .
- Texas Instruments Chip manufacturer ΤI .
- Τx Transmission
- UART Serial port with logic level signaling (0-5V) .
- USB Universal Serial Bus



3 Hardware Installation Procedure

The section describes how to connect the RTX2254 Bluetooth RF tester.

3.1 Connection Overview







3.2 Installation

The RTX2254 test system comes preassembled and needs only the following:

- 1. Connect power cord (100-240 V)
- 2. Prepare, but do not connect a USB cable to PC
- 3. Turn on power on backside of RTX2254
- 4. Turn on PC





4 Software Installation Procedures

The RTX2254 SW package includes the necessary drivers and RTX2254 Bluetooth RF tester software. The following drivers and supporting Windows application are included:

- RTX EAI Port Server
- RTX USB Bridge Driver (CP210x USB to UART Bridge)
- Microsoft Visual Studio C++ 2010 Runtime Library (.net)
- RTX2254 demo application (a sample application project)
- RTX2254 Bluetooth RF tester application

Please refer to the RTX2254 User Manual for more information on how to use the tester.

4.1 Software Installation File #1

4.1.1 RTX2254 Bluetooth RF Tester Software Installation

Locate the file: "*Setup_RTX2254_Bluetooth_RF_Tester_V0111.exe*" and execute it. The following pop-up will appear.

📴 Setup - RTX2254 Bluetooth RF Tester - V0111	
Select Destination Location Where should RTX2254 Bluetooth RF Tester - V0111 be installed?	
Setup will install RTX2254 Bluetooth RF Tester - V0111 into the folder.	following
To continue, click Next. If you would like to select a different folder, clic	k Browse.
C:\Program Files (x86)\RTX\RTX2254 Bluetooth RF Tester\V0111	Browse
At least 59, 1 MB of free disk space is required.	
Next >	Cancel

Select the preferred installation folder or stick with the proposed one. Then click **[Next >]**.



Setup - RTX2254 Bluetooth RF Tester - V0111		× _
Select Start Menu Folder Where should Setup place the program's shortcuts?	Ø	
Setup will create the program's shortcuts in the following Start Me	enu folder.	
To continue, dick Next. If you would like to select a different folder, dick E	rowse.	
\RTX\RTX2254 Bluetooth RF Tester\V0111	Browse]
		_
< Back Next >	Can	cel

Click [Next >] again to continue

	🔂 Setup - RTX2254 Bluetooth RF Tester - V0111
	Select Additional Tasks Which additional tasks should be performed?
	Select the additional tasks you would like Setup to perform while installing RTX2254 Bluetooth RF Tester - V0111, then click Next.
	Additional shortcuts:
	Create a desktop shortcut
	Additional software:
	RTX2254 demo application Image: Copy the sample application to the installation folder. Refer to the RTX2254 Image: User Manual for more details)
/	
	< Back Next > Cancel

Select to add:

/

- An application shortcut to your desktopThe RTX2254 demo application to your installation folder

Or deselect to skip item.

Then click [Next >].



ady to Install Setup is now ready to begin installing RTX225 your computer.	4 Bluetooth RF Tester - V	0111 on	¢
Click Install to continue with the installation, o change any settings.	r dick Back if you want to	review or	
Destination location: C: \Program Files (x86)\RTX\RTX2254 Blu Start Menu folder: RTX\RTX2254 Bluetooth RF Tester\V011	etooth RF Tester\V0111		*
Additional tasks: Additional shortcuts: Create a desktop shortcut			
4		4	Ŧ

The programs are now ready to be installed.

Click **[Install]** to install the programs at the shown location.



4.1.2 Drivers Installation



By default, 2 different drivers and optionally the development environment can be installed. The installer will present 32 bit (X86) or 64 bit (x64) drivers depending on the used PC's operating system.

Furthermore 4 different documents can be automatically opened after installation:

- Release note
 The latest changes and information about new firmware
- Quick Guide This quick guide to get you started
- User Manual A description of the tester's features, i.e. how to perform a test and a more detailed hardware description
- API Specification A description of the different functions in the API and the required parameters

Please select the ones you would like to read and then click [Finish].

Please note that:

All the documents can be found in the installation folder.



4.1.3 RTX EAI Port Server Installation



Now the EAI Port Server will be installed. Please click: [Next >].

🚰 Setup - RTX EAI Port Server		x
Select Destination Location Where should RTX EAI Port Server be installed?		ß
Setup will install RTX EAI Port Server into the following folder.		
To continue, click Next. If you would like to select a different folder, click	Browse.	
c:\RtxTools\RtxEaiPortServer	Browse	
At least 3,6 MB of free disk space is required.		
< Back Next >	Cance	2

Select the preferred installation folder or stick with the proposed one. Then click **[Next >]**.



🕞 Setup - RTX EAI Port Server	- - X
Ready to Install Setup is now ready to begin installing RTX EAI Port Server on your computer	
Click Install to continue with the installation, or click Back if you want to revie change any settings.	ew or
Destination location: c:\RtxTools\RtxEaiPortServer	*
4	+
< Back Install	Cancel

Now the EAI Port Server will be installed. Please click: [Install >].



Remove the check mark in Launch RTX EAI Port Server.

Now click [Finish].



4.1.4 UART Bridge Driver Installation



Now click [Next >].

CP210x USB to	UART Bridge Driver Installer
License Ag	preement S
Ń	To continue, accept the following license agreement. To read the entire agreement, use the scroll bar or press the Page Down key.
	mutual understanding between you and Silicon Labs with respect to this subject matter herein. This Agreement may only be modified by a written addendum, which has been signed by both you and Silicon Labs. BY CLICKING "I ACCEPT THE TERMS OF THIS AGREEMENT" YOU AGREE TO ACCEPT AND COMPLY WITH THE TERMS OF THIS LICENSE AGREEMENT WITH SILICON LABORATORIES INC.
	I accept this agreement Save As Print
	< Back Next > Cancel

Please read and select the **[I accept this agreement]** and then click **[Next >]**.



💽 Windows Security	Press of the	×
Would you like to install	this device	software?
Name: RTX A/S Port Publisher: RTX A/S	s (COM & LPT)	
Always trust software from	"RTX A/S".	Install Don't Install
You should only install driv I decide which device softw	ver software from vare is safe to in:	m publishers you trust. <u>How can</u> <u>istall?</u>

If this window appears, then please click [Install].

CP210x USB to UART Bridge Dr	river Installer	
	Completing the Installation of the CP210x USB to UART Bridge Driver	
	The device driver installation wizard did not upd software for your hardware devices because it w the software you currently have installed.	late any of your was not better than
	Driver Name	Status
	RTX A/S (silabser) Ports (09/19/2016	Ready to use
	<	•
	< Back Finish	Cancel

Now click [Finish].



4.1.5 Microsoft Drivers Installation

The Microsoft C++ run time libraries might already be installed on the PC.



Please read and select the **[I have read and accept the license terms]** and then click **[Install]**.



Click [Finish].

Now all needed programs and drivers are installed on your PC.



4.2 Software Installation File #2

This is a separate delivery containing a demo project which shows how the API is used in a production test system. Microsoft Visual Studio C++ must be installed.

Please note that:

This is not required for the RTX2254 Bluetooth RF Tester SW to function. If not needed you can skip this section.

4.2.1 RTX Demo Software Installation

Locate the file: "**TestProj_RTX2254_BT-D0111.zip**" in <installation folder>\RTX\RTX2254 Bluetooth RF Tester\V0111\Sample_app\".

Unpack the ZIP-file and copy it to your preferred folder.

Please note that:

The most resent version will have the highest version number in the filename. Please use the newest one for best experience.

Microsoft Visual Studio C++ will automatically start when selecting the file "**TestProj_RTX2254_BT.sln**".

Please enter the COM port number for your system and recompile the project before running the example.

Refer to the RTX2254 User Manual for more info about the demo test project.

C:\Tmp\TestProj_RTX2254_BT-D0110\Debug\Te	estProject.exe	
+ : Starting RTX2254 Bluetooth : SW version: D0110 / 2018 +	RF TestProject : .08.07-13:41 :	•
<pre>:::=== T e s t P r o j e o :::=== T e s t P r o j e o :::=== T e s t P r o j e o :::===</pre>	c t M E N U==:::: A. Open communication to TESTER B. Close communication to TESTER C. Select UART0 and open communication D. Select UART1 and open communication E. Select USB0 and open communication F. Select USB1 and open communication G. Change Loop counter (3) H. Change COM port numbers I. Show COM port numbers J. Clear all testresults K. Open communication to DUT L. Close communication to DUT	-

Demo project



5 Software Configuration

The different USB COM port drivers should be configured as shown in the following:

With a powered RTX2254 Bluetooth RF tester and PC, please connect USB cable between them.

Now the drivers should automatically be installed. If not, then please use the options: "*No, not this time*" and "*Install the software automatically (Recommended)*", when or if prompted.

5.1 Configuration of RTX EAI Server

It is strongly emphasized here that it is crucial to configure the RTX EAI Port Server correctly. Hence, if an error is encountered when launching the RTX2254 Bluetooth RF tester application it is most likely related to an erroneous configuration of the port server. Please configure it as described below.

5.1.1 Find the COM Port to use

Open the "**Device Manager**" by selecting "**Control Panel**" from the Windows main menu or type "devmgmt.msc" in Windows search.

Then unfold the "**Ports (COM & LPT)**" line. The COM port numbers shown are system specific and vary from PC to PC:



RTX2254 COM port 10,11,12 DUT UART COM 20 and 21



The "**RTX EAI Port Server**" needs the communication port number from: "**RTX BLE Tester (COM10)**" line

- please note this no. "10" for later use.

The "**RTX2254 Bluetooth RF tester SW**" needs the communication port number from: "**RTX BLE generator (COM11)**" line for the generator communication – please note this no. "11" for later use.

The "**RTX2254 Bluetooth RF tester SW**" needs the communication port number from: "**RTX BLE Analyser (COM12)**" line for the analyser communication

- please note this no. "12" for later use.

Please note that:

The 2 UART COM ports are shown (See picture above with DUT 0 and DUT 1 as COM20 and COM21). UART is selected by default.

The 2 USB Ports (here only one "Test DUT" is connected as COM22) are only shown when USB interface is selected from the program.



RTX2254 COM port 10,11,12 "Test DUT" on USB COM 22

A minimum of 4 COM port numbers are required. 3 COM ports (Tester, Generator and Analyzer) for the RTX2254 Bluetooth RF tester and 1 COM port for a test DUT is required when configuring the program later.

Please note that:

You must first setup the 3 COM ports (Tester, Generator and Analyzer) to be able to select USB as DUT interface to get the test DUT COM port.



5.1.2 Setup the RTX EAI Server

Please check that the icon "**RTX EAI**" is present in the task bar, like below picture:



If not started, then start it manually from Windows start button:

"Start \rightarrow All programs \rightarrow RTX Telecom \rightarrow RTX EAI Port Server"

Now right click on the icon on the task bar and select the Setup window (see below).



When selecting the **Setup** line, the following window will pop-up.

RTX EAI Port Server Configuration
General UART Socket USB HID Transport Layer • UART • USB (Using RTX UniUsb driver) • USB (Using RTX FlexUsb Driver) • USB HID • REPS Client (PC Simulation) • Loopback • Socket • Disabled
RTX2254PortServer Stop Server
Log Options Log Binary Data To File Show Data in Log Window Log data from the Log Window to file
Default <u>O</u> K Cancel

Please note that:

The **Transport Layer** will be set to **Disabled** if communication is not possible. In that case – go here, correct the HW problem and enable it again. Now please set the **"UART**" window as shown below.



RTX EAI Port Server Configura	ation 💌
General UART Socket U	SB HID
Port	Stop bits
COM# 10	I stop bit
Speed (bps) 115200	C 2 stop bits
RTS input flow control	Parity
 Automatic 	• None
C Manual (RTS High)	O Oqq
O Manual (RTS Low)	O Even
Output flow control	La La La Carta
	eout [ms] 1000
Packet based Not	Jf Retrans. 4
Use Window Based Flov	v Control tion
<u>D</u> efault	<u>D</u> K <u>C</u> ancel

Please enter the COM port number from "**Device Manager**" page. Here it is 10 and be sure to check that the other fields are set as shown above.

The same apply for the following 2 pages.

Please note that:

The Tester COM port number can also be setup in the RTX2254 application.

In RTX2254 application, set Tester COM = 255 to use the manually setup COM port in the RTX Portserver application above.



RTX EAI Port Sei	rver Configuration	×
General UART	Socket USB H	ю)
Socket Type Client C Server	IP Config Host IP 127.0 Port 20000	.0.1
Socket Protoc Raw TI GSM T Trace ID	race multiplexer	
EAP options	eck sum	
☑ Auto re-co	onnect	
<u>D</u> efault	<u>0</u> K	Cancel
RTX EAI Port Sei	rver Configuration	X
General UART Device Selec Use Spec VID 0000	ific Serial Number:	
General UART Device Selec Use Spec VID 0000	ific Device: PID 0000 ific Serial Number:	
General UART Device Selec Use Spec VID 0000	ific Device: PID 0000 ific Serial Number:	

Now click **[OK]**. This will save the current setup configuration.

It can be found in the file: "c:\Program Files (x86)\RTX\RTX2254 Bluetooth RF Tester\Vxxxx\RtxEaiPortServer.ini"



6 The First Test

To guide the user through the first test, the following simple test are shown.

A test DUT, setup for production test, must be available. A DUT with USB is used in this description.

6.1 Set-up of HW for First Test

Please do the following:

- 1. Place tester and PC on a solid table
- 2. Connect power cables
- 3. Connect PC and Tester with a USB cable
- 4. Insert the "Test DUT" in appropriate DUT interface (UART / USB), e.g. USB0
- 5. Connect RF cable from "Test DUT", e.g. DUT0 RF port as shown in below picture.
- 6. Now turn on PC and the **RTX2254 Bluetooth RF tester** hardware.



"Test DUT" is connected to DUT0 RF and USB

Please note that:

RTX2254 is available as a single ported tester for one DUT (RTX no. 95101347) or as a dual ported tester for two DUTs (RTX no. 95101348).



6.2 Set-up of SW for First Test

Start the "**RTX2254 Bluetooth RF tester**" SW by clicking the Windows start button and selecting:

"Start \rightarrow All programs \rightarrow RTX \rightarrow RTX2254 Bluetooth RF tester \rightarrow V0111 \rightarrow RTX2254 Bluetooth RF tester".

The below picture will be shown:



If it doesn't disappear then an error probably has occurred. This error pop-up is hidden below the splash screen (Will be corrected in a later release) and can be shown in the following way:

- Press [ALT] + [TAB] until error pop-up has been selected
- Press [ALT] + [SPACE] once
- Press [M] for move window
- Press [Arrow-down] several times
- When fully visible press [ENTER]

The first time you will see the below error – because the program has not been configured yet.

BtTst critical error	22
Error opening Generator COM port 2 in Tester interfa RTX2300_ERR_NO_ACCESS Go to the 'Settings' tab and select the correct COM p	ace: port, press Save and restart.
	ОК

Click **[OK]** and the real program will appear.

If the error pop-up looks like the following, then the RTX EAI Port Server are probably failing and you must configure it correctly.



BtTst DLL f	atal error
8	Reps client reported an error 14 Error msg: REPS_ERROR_FAILED_TO_SET_TL The transport layer has been disabled! Continue execution?
	OK Cancel

Эr
-



If the error pop-up looks like the following, then the RTX EAI Port Server are probably failing and you must configure it correctly.

🌡 BtTst	critical error
	Error opening the Tester interface: RTX2300_ERR_NO_ACCESS
	ОК



6.2.1 Select DUT Test Protocol

Please select the [Configuration] tab.

Set the limit numbers to meaningful values, like below picture shows.

The DUT cable loss depends on your selected cable, e.g. here it is set to 1 dBm loss.

Select the test protocol (HCI or 2-wire) to use with the **"Test DUT"**. In this example, HCI is selected as "DUT Communication Protocol".

Main DIT Tecter System MeasureLose Settings Configuration	
Main DUI lester System Measure Logs Settings Conliguration	
Test results Limits	
Vest results must be within these limits to be valid. Min Max	
DUT Frequency Offset (ppm) -40,00 🖶 40,00 荣	
DUT Tx Output Power (dBm) -20,00 👻 10,00 荣	
PER - Packet Error Rate (%) 30,80 🖨	
Save	
DUT Configuration	
DUT cable loss settings (positive number): DUT 0 cable loss (dBm) 0.00	
DUT 1 cable loss (dBm)	
DUT Communication Protocol	
Save	
	4
DUT:	HCI 0xFFFFFFFFFFF • Generator & Analyzer: • Tes

Then click [Save].

Please note that:

The DUT has not been opened yet and DUT status is read.



6.2.2 Setup COM Ports

Under this **[Settings]** Tab, set the COM port value found earlier, for each of the 4 DUT interfaces and for the 3 internal instruments (Tester / Analyzer / Generator).

Please note that:

If Tester COM = 255 is entered, the COM port specified in the "RTX EAI Server" is used. Select the 'Auto open' option to automatically open the RTX2254 tester COM ports.

Set the DUT configuration as required by your specific DUT.

Click **[Save]** for each section to store setting.

Click **[Open]** to open the COM ports.

Tester interface		DUT interface
COM ports		DUT Port Selected: DUT 0 USB COM port 22
	Select System COM Ports: Save	DIIT BT Address: 0x5CE8218BD154
PortServer	Tester Generator Analyzer Auto onon	UART Interface
Set Tester=255		DUT 0 COM Port
from portserver		115200 V Kill Slaw Capital 20
		113200 • W HW HW Control 20 • Save
Interface		DUT 1 COM Port
		115200 V HW Flow Control 21 🔶 Save
	Open Close	USB Interface
Tester instance		DUT 0 COM Port
Info		115200 V HW Flow Control 22 🚔 Save
Inst. name	RTX2254 Bluetooth RF Tester	DIT 1 COM Part
PortServer name	RTX2254PortServer	
Inst. number	1	115200 V HW How Control 23 V Save
		Interface
		The DUT port opened is the one selected
		in DUT configuration in Main or DUT Open Close
		Then

Please note that:

The firmware in the **RTX2254 Bluetooth RF tester** is checked when starting the application. Please follow the instructions to update the firmware if required.

Then please select the tab called **[Main]** as in the following.



6.2.3 Setup DUT for Test

In **[DUT Port Selection]** frame, please select the correct RF port and interface to use for tests. Then click **[Select]**.

Now check that **DUT** are checked in the **[Open interface]** box and that the 3 status LED's are green in the lower, right frame.

To store the settings, click [Save].

Burst	Mode No. of Packets 500	Payload Length	Payload	Type M9 (PRBS9) 🔻	Power Level [dt	Open Interface B] DUT Reset DUT	DUT Port Selection DUT0 RF Select DUT0 USB	Settings Save
Select RI	Channel 1	RF Channel 2	19 🗣	F Channel 3	Channe Ch. 0 Ch. 1 Ch. 19 Ch. 39	Mapping: = 2402 MHz = 2404 MHz = 2404 MHz = 2440 MHz = 2480 MHz	Select	
Select Tes	ts to Run: requency Offset							
V	-Hz	_	Hz	-	Hz			
	- ppm	- p	pm	- p	pm			
2) DUT T	x Output Power							
V	- dBm	- d	Bm	- d	Bm			
Erro	or Rate – %	_	%		%	Sta	rt test	
OK	Count							
	_		-		-			
Erro	or Count		_					
est Run		Tost Status						
Star	Loop Test No.	Current Channel			Test Limit Errors	· ۲	Ch. Test Time (ms)	
Stop	1 荣	0 Ch.	Cable Loss	Test Completed	Offset	0 Time Out Errors	Last 0,00 Tota	l Test Time (s)
	Test Delay (ms)	2402 MHz	0,00	0	Tx Pwr	0 0	Avg. 0,00	0,000

The **RTX2254 Bluetooth RF tester** is now configured and ready for testing. Close the application.

Please note that:

RTX2254 is available as a single ported tester for one DUT (RTX no. 95101347) or as a dual ported tester for two DUTs (RTX no. 95101348).



6.3 Starting the Test

Start the "**RTX2254 Bluetooth RF tester**" SW by clicking the Windows start button and selecting:

"Start → All programs → RTX → RTX2254 Bluetooth RF tester → V0111 → RTX2254 Bluetooth RF tester".

The below or similar screen will appear after a short time.

Burst	PER Test - Pack	Payload Length	Payload	d Type DM9 (PRBS9) ▼	Power Leve	el [dB]	Open Interface DUT Reset DUT	DUT Port Sel	ection Settings Save Click "Save"
Select RF Phy RF Char	ysical Channels inel 1 0 🛊	RF Channel 2	9 🗢 🛛	₹ Channel 3	Cha Ch 39 🗣 Ch Ch	annel Mapp . 0 = 24 . 1 = 24 . 19 = 24 . 39 = 24	oing: 02 MHz 04 MHz 40 MHz 80 MHz	Select	to store setup
Select Tests to	Run:								
1) DUT Frequ	ency Offset								
	-HZ	-	HZ	-	HZ				
	- ppm	- pp	om	- p	pm				
2) DUT Tx Ou	tput Power								
v	- dBm	- dB	Sm	- d	Bm				
- 3) PER - Pack	et Fror Rate (Burst I								
-3) PER - Pack	te – %	_ (%		%		Sta	art test	
-3) PER - Pack	te Error Rate (Burst)	_ (%	-	%		Sta	art test	
3) PER - Pack	te	_ (%	-	%		Sta	art test	
3) PER - Pack	te	_ (%	-	%		Sta	art test	
3) PER - Pack	te = - %	_ (-	-	% -		Sta	art test	
3) PER - Pack	te = _ %	_ (-		%		Sta	art test	
3) PER - Pack	te(inst in)	(% -		%		Sta	art test	
3) PER - Pack	te - %)	est Status	%	- Test Completed	%	rrors	Sta	Ch. Test Time (m Last 0.00	s) (Total Test Time (s)
3) PER - Pack	te - %	est Status Current Channel 2402 MHz	9%	Test Completed	- Test Limit Er Offset Tx Pwr	rrors 0 0	Sta Time Out Errors	Ch. Test Time (m: Last 0,00 Avg. 0,00	s) Total Test Time (s) 0,000
3) PER - Pack	Loop Test No. Image: Comparison of the second	2st Status Current Channel 2402 MHz	% - Cable Loss 0,00	Test Completed	Test Limit El Offset	rrors 0 0	Sta Time Out Errors	Ch. Test Time (m: Last 0,00 Xvg. 0,00	s) Total Test Time (s) 0,000

Now click **[Start]** and the testing will commence.



	PER Test - Pac	ket Parameters					Open Interface	DUT Port Select	tion Settings
Measure Mode	No. of Packets	s Payload Leng	th Payload	Туре	Power Le	evel [dB]	DUT	DUTO RE Solos	t T
Burst 🔹	500 🖨	37 🖨	RANDO	M9 (PRBS9) 🔹	-4	40 🖨	Reset DUT	DUTO USB	save
Select DE Dhue	ical Channels							Falact	to store setup
RF Chann	al 1 0 束	RF Channel 2	19 🖈	F Channel 3	39 🗣 🖸	Ch. 0 = 2 Ch. 1 = 2 Ch. 19 = 2 Ch. 39 = 2	9009: 402 MHz 404 MHz 440 MHz 480 MHz	Juli	
alact Tasts to I									
1) DUT Ereque	ncy Offeet								
1) DOT Freque	icy onset								
☑ 1	9443 Hz	1918	2 Hz	16418	Hz				
		7.00		6.70					
8	U9 ppm	/.99	opm	6.78 p	pm				
2) DUT Tx Outr	out Power								
_						1			
1	3 7 dRm	4.0 6	1Bm	3.2 d	Bm				
2) PEP - Packa	Error Pate (Rurd	t Mode Only)							
3) PER - Packe	t Error Rate (Burst	t Mode Only)							
3) PER - Packe	t Error Rate (Burs	t Mode Only)					Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)		0.00	0/2		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) %	0.00	<u>%</u>		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) %	0.00	<u>%</u>		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) %	0.00	%		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) % 500	0.00	<u>%</u>		Test	PASSED	
3) PER - Packe	t Error Rate (Burs 0.00 % 500	t Mode Only)) % 500	0.00	% 00		Test	PASSED	
3) PER - Packe	t Error Rate (Burs 0.00 % 500	t Mode Only)	500	0.00	%] 00		Test	PASSED	
3) PER - Packe	t Error Rate (Burs 0.00 % 500 1t	t Mode Only)) % 500	0.00	%] 00]		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) % 500 0	0.00 5	% 00 0		Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) % 500	0.00	% 00	ļ	Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)	0 %	0.00 5	9% <u> </u> 00	,	Test	PASSED	
3) PER - Packe	t Error Rate (Burs	t Mode Only)) % 500 0	0.00	9%6	Errors	Test	Ch. Test Time (ms)	
3) PER - Packee Contemporation Conte	t Error Rate (Burs	t Mode Only)	0 %	0.00 5	9/6 00	Errors	Time Out Errors	Ch. Test Time (ms) Last 3793,15	Total Test Time (s)
3) PER - Packee Fror Rate CK Count Error Cou est Run Start Stop	t Error Rate (Burs 0.00 % 500 at	t Mode Only)	0 %	Completed	9⁄0 00 Test Limit offset Tx Pwr	Errors 0 0	Time Out Errors	PASSED Ch. Test Time (ms) Last 3793,15 Avg. 3793,84	Total Test Time (s)
3) PER - Packe	t Error Rate (Burs	t Mode Only)	Cable Loss	0.00 5	9/0 00 Test Limit Offset Tx Pvr PSR	Errors 0 0	Test	Ch. Test Time (ms) Last 3793,15 Avg. 3793,84	Total Test Time (s)

When the test has completed the following picture should look like the above.

Please refer to the instructions in the "RTX2254 User Manual" on how to use other features of the RTX2254 Bluetooth RF tester and a more detailed hardware description.



7 Safety Information

7.1 General

The following general safety precautions must be observed during all phases of operation and service of this instrument. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the instrument. RTX A/S assumes no liability for the customer's failure to comply with these requirements.



<u>DO NOT</u> operate the product in an explosive atmosphere or in the presence of flammable gasses or fumes.



<u>DO NOT</u> use repaired fuses or short-circuited fuse holders: For continued protection against fire, replace the line fuse(s) only with fuse(s) of the same voltage and current rating and type.



<u>DO NOT</u> perform procedures involving cover or shield removal unless you are qualified to do so – it is therefore strongly emphasized here that operating personnel must not remove equipment covers or shields. Procedures involving the removal of covers and shields are for use by service-trained personnel at RTX A/S only.

7.2 Electrostatic Discharge

Electrostatic discharge (ESD) can damage electronic test equipment. Working with electronic components or test equipment should always be performed at a static-safe place.

7.3 High Voltage

Some power supplies can generate high voltage, which can damage any of the ports of the unit.

To prevent damage to the RTX2254 Bluetooth RF tester please make sure that the device is properly earthed. Connect the RF cable path before applying DC power to the test device. Be careful when connecting RF connectors, i.e. avoid touching any unearthed metal with the centre core.