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## The BlueNRG-1, BlueNRG-2 SDK compatibility matrixes

### Introduction

This document describes the BlueNRG-1, BlueNRG-2 development kits (STSW-BLUENRG1-DK) and the BlueNRG-1 development kit (STSW-BNRG\_V1-DK) compatibility matrixes. Each compatibility matrix provides the following information:

- Development kit version and release date
- Development kit supported devices
- Development kit supported Bluetooth Low Energy stack version

In addition to this a dedicated section is also present to describe possible incompatibilities in specific use cases.

# 1 STSW-BLUENRG1-DK, STSW-BNRG\_V1-DK releases and main features

The STSW-BLUENRG1-DK releases and main distinctive features are reported in the following table:

**Table 1. STSW-BLUENRG1-DK releases and main features**

STSWBLUENRG1-DK release number	Release date	Bluetooth LE stack version	Main features
<b>3.2.1</b>	4/30/2020	v2.1c	BlueNRG-1, BlueNRG-2 + BLE specifications 4.2 + modular configuration
<b>3.2.0</b>	3/6/2020	v2.1b	BlueNRG-1, BlueNRG-2 + BLE specifications 4.2 + modular configuration
<b>3.1.0</b>	12/14/2018	v2.1a	BlueNRG-1, BlueNRG-2 + BLE specification 4.2 + modular configuration
<b>3.0.0</b>	6/22/2018	v2.1	BlueNRG-1, BlueNRG-2 + BLE specifications 4.2 + modular configuration
<b>2.6.0</b>	12/18/2017	v2.0	BlueNRG-1, BlueNRG-2 + BLE specifications 4.2 + 2.4 GHz radio proprietary support
<b>2.5.0</b>	6/27/2017	v2.0	BlueNRG-1, BlueNRG-2 + BLE specifications 4.2
<b>2.4.0</b>	6/14/2017	v2.0	BlueNRG-1 + BLE specifications 4.2
<b>2.3.0</b>	12/2/2016	v1.0a	BlueNRG-1 + BLE specifications 4.0
<b>2.2.0</b>	10/7/2016	v1.0a	BlueNRG-1 + BLE specifications 4.0
<b>2.1.0</b>	7/5/2016	v1.0	BlueNRG-1 + BLE specifications 4.0

The STSW-BNRG\_V1-DK releases and main distinctive features are reported on the following table:

**Table 2. STSW-BNRG-V1-DK releases and main features**

STSW-BNRG_V1-DK release number	Release date	Bluetooth LE stack version	Main features
1.0.0	10/20/2017	v1.1	BlueNRG-1 BLE specifications 4.0

The main features column identifies the STSW-BLUENRG1-DK , STSW-BNRG\_V1-DK software package release families and define the main migration guidelines to migrate an user application to the latest available software package. Refer to related software packages release notes for more detailed information.

## 2 The BlueNRG-1, BlueNRG-2 development kit compatibility matrixes

The STSW-BLUENRG1-DK development kit supports both the BlueNRG-1 and the BlueNRG-2 devices. The following table describes the STSW-BLUENRG1-DK compatibility matrix

**Table 3. STSW-BLUENRG1-DK development kit compatibility matrix**

STSW-BLUENRG1-DK <sup>(1)</sup> release number	Release date	BLE stack version	BlueNRG-1 cut 1.1 <sup>(2)(3)</sup>	BlueNRG-1 cut 1.3 <sup>(2)(3)</sup>	BlueNRG-2 cut 1.0 <sup>(2)(3)</sup>	BlueNRG-2 cut 1.2 <sup>(2)(3)</sup>
3.2.1	04/30/2020	v2.1c	x	x	x	x
3.2.0	03/06/2020	v2.1b	x	x	x	x
3.1.0	12/14/2018	v2.1a	x	x	x	x
3.0.0	06/22/2018	v2.1	x	x	x	x
2.6.0	12/18/2017	v2.0	x	-	x	-
2.5.0	06/27/2017	v2.0	x	-	x	-
2.4.0	06/14/2017	v2.0	x	-	x	-
2.3.0	12/02/2016	v1.0a	x	-	x	-
2.2.0	10/07/2016	v1.0a	x	-	x	-
2.1.0	07/05/2016	v1.0	x	-	x	-

1. Customer using the STSW-BLUENRG1-DK prior to 3.0.0 with the BLUENRG-1 cut 1.3 and the BLUENRG-2 cut 1.2 may experience some problems since BOR is not enabled upon the initialization phase.
2. Refer to the device identification table for the device cut recognition
3. Refer to [Section 3 Compatibility issues in specific use cases](#) to make a final assessment for the software development kit and the device compatibility.

Legend:

- x = supported
- - = not supported

The STSW-BNRG\_V1-DK development kit supports the BlueNRG-1 device only. The related compatibility matrix as follows:

**Table 4. STSW-BNRG\_V1-DK development kit compatibility matrix**

STSW-BNRG_V1-DK <sup>(1)</sup> release number	Release date	BLE stack version	BlueNRG-1 cut 1.1 <sup>(2)(3)</sup>	BlueNRG-1 cut 1.3 <sup>(2)(3)</sup>	BlueNRG-2 cut 1.0 <sup>(2)(3)</sup>	BlueNRG-2 cut 1.2 <sup>(2)(3)</sup>
1.0.0	10/20/2017	v1.1	x	-	-	-

1. NRND (not recommended for new design)
2. Refer to the device identification table for the device cut recognition
3. Refer to [Section 3 Compatibility issues in specific use cases](#) to make a final assessment for the software development kit and the device compatibility.

Legend:

- x = supported
- - = not supported

The following table provides the device identification information about the BlueNRG-1, BlueNRG-2 devices:

**Table 5. Device identification**

Device	Identification information of the device <sup>(1)</sup>	Device cut
BlueNRG-1	0x00000111	1.1
BlueNRG-1	0x00000113	1.3
BlueNRG-2	0x00000100	1.0
BlueNRG-2	0x00000112	1.2

1. Value as read from CKGEN\_SOC - DIE\_ID register (0x4090001C)

### 3 Compatibility issues in specific use cases

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This section describes a list of known compatibility issues in specific use cases. The content should be read in conjunction with [Section 2 The BlueNRG-1, BlueNRG-2 development kit compatibility matrixes](#) to make a final assessment for the software development kit (SDK) and the device compatibility.

Each specific compatibility issue is provided with the following information:

- **Description:** description of the compatibility issue
- **Impact:** effect on the customer product of the compatibility issue
- **Context:** describe under which conditions the compatibility issue occurs, i.e. which SDK and the device combination impacted and under which conditions
- **Severity:** scale of severity in 5 degrees
  1. Catastrophic defect
  2. Impaired functionality
  3. Failure of non-critical aspects
  4. Defect of minor significance
  5. Very minor defect
- **Workaround:** possible workaround, if available
- **Solution:** proper solution if available

### 3.1 BOR\_Config issue

Table 6. STSW-BLUENRG1-DK BOR\_Config issue

Issue information	Issue information details	Notes
Description	BOR_Config variable is shared between OTA service manager and Bluetooth LE application. Each time the device wakes up from sleep mode, the code starts execution from the OTA service manager FW and it reads the shared variable BOR_Config to execute some operations. If the BOR_Config variable on the user application is allocated on a different address the stored values are not consistent and this could cause a RAM memory corruption with hard fault.	
Impact	RAM memory corruption and user application hard fault.	
Context	Bluetooth LE applications using OTA service manager framework, the STSW-BLUENRG1-DK v3.0.0 or v3.1.0, BlueNRG-1 cut 1.3 or the BlueNRG-2 cut 1.2.	
Severity	1: Catastrophic defect (application is in hard fault)	
Workaround	<p>Customer needs to modify the user application. The BOR_Config variable should be allocated in a reserved RAM region at the same address of OTA service manager as follows:</p> <ol style="list-style-type: none"> <li>Open the map file of the OTA service manager FW and read the address of the BOR_config variable: bor_config_address</li> <li>Modify the system_bluenrg1.c by replacing volatile uint8_t BOR_config[7]; with           <pre>SECTION(".BOR_config") REQUIRED(volatile uint8_t BOR_config[7]);</pre> </li> <li>Change the user application linker file by adding section for BOR_Config variable at specific address:           <ul style="list-style-type: none"> <li><b>IAR icf:</b> <pre>/*BOR_config Block */ define block BOR_config_block with alignment = 4, size = 8 { section .BOR_config}; keep {section .BOR_config}; place at address mem: bor_config_address { block BOR_config_block, };</pre> </li> <li><b>KEIL sct:</b> <pre>BOR_config_block bor_config_address 8 { *.o (.BOR_config) }</pre> </li> </ul> </li> </ol>	
Solution	Migrate user application to the latest STSW-BLUENRG1-DK (the related linker files properly handle the BOR_Config variable)	Refer to <a href="#">Section A.1 STSW-BLUENRG1-DK basic migration guidelines</a>

## 4 References

**Table 7. References**

Name	Title/description
AN5187	The BlueNRG-1, BlueNRG-2 improving robustness
ES0454	The BlueNRG-1 device limitations
ES0436	The BlueNRG-2 device limitations

## Appendix A

### A.1 STSW-BLUENRG1-DK basic migration guidelines

This section describes some general basic migration guidelines to port a customer application to a newer software development kit (SDK) version (STSW-BLUENRG1-DK). Some key information are:

- Migration within the same major version family is easier (ie. SDK 2.x to SDK 2.x or SDK 3.x to SDK 3.x).
- Migrating user application is easier if customer does not have to change the linker file and the files under Library directory provided by ST.
- It is recommended to migrate to the latest available SDK (current version is V3.2.1).

A set of general basic guidelines is provided as follows:

1. Refer to [Table 3. STSW-BLUENRG1-DK development kit compatibility matrix](#) for information about SDKs compatibility matrix versus the BlueNRG-1, BlueNRG-2 device cuts (which SDKs can be used on which device cuts).
2. Refer to the recommendations described on “The BlueNRG-1, BlueNRG-2 improving robustness” Application Note (AN5187: [Table 7. References](#)).
3. The STSW-BLUENRG1-DK v3.x.x, supporting the BlueNRG-1, BlueNRG-2 devices and Bluetooth LE stack v2.1x family, migration of a user application can be simply performed by moving the user application folder under the STSW-BLUENRG1-DK v3.2.1, Projects\BLE\_Examples folder. The user should also check the related IDE linker file to align to the latest one (if needed), and then recompile.
4. The STSW-BLUENRG1-DK v2.x.x, supporting the BlueNRG-1, BlueNRG-2 devices and Bluetooth LE stack v2.0, migration of a user application, can be performed by moving the user demo folder under the STSW-BLUENRG1-DK v3.2.1, Projects\BLE\_Examples folder. The user should also check the related IDE linker file to align to the latest one (if needed) and add the specific modular configuration option.  
(**BLE\_STACK\_CONFIGURATION=BLE\_STACK\_FULL\_CONFIGURATION** if full stack features are needed or **BLE\_STACK\_CONFIGURATION=BLE\_OTA\_BASIC\_CONFIGURATION** to select the OTA service support with data length extension).
5. The STSW-BLUENRG1-DK v2.x.x, supporting the BlueNRG-1, BlueNRG-2 devices and Bluetooth LE stack v1.x, migration of a user application, can be performed by moving the user demo folder under the STSW-BLUENRG1-DK v3.2.1, Projects\BLE\_Examples folder. The user should also check the related IDE linker file to align to the latest one (if needed) and add the specific modular configuration option  
(**BLE\_STACK\_CONFIGURATION=BLE\_STACK\_FULL\_CONFIGURATION** if full stack features are needed or **BLE\_STACK\_CONFIGURATION=BLE\_OTA\_BASIC\_CONFIGURATION** to select the OTA service support with data length extension). Further, the user should follow the Bluetooth LE stack migration guidelines from v1.x to v2.x provided within the STSW-BLUENRG1-DK, Docs \BlueNRG1\_BLE\_stacks\_migration folder.

*Note:* Some further customizations could still be needed when moving to the latest STSW-BLUENRG1-DK SW package.

### A.2 STSW-BNRG\_V1-DK basic migration guidelines

This section describes some general basic migration guidelines to port a customer application built on the STSW-BNRG\_V1-DK to a newer software development kit (SDK) version (STSW-BLUENRG1-DK).

Some key information are:

- Refer to the “Migration guidelines from BlueNRG-1 DK 2.3.0 to BlueNRG-1\_V1 DK 1.0.0” document available on the STSW-BNRG\_V1-DK software package installation path:
  - \Docs\BlueNRG1\_V1\_migration\b\_l\_e\_v1\_migration\_8h.html.
- Refer to information provided on [Section A.1 STSW-BLUENRG1-DK basic migration guidelines](#).



## Revision history

**Table 8. Document revision history**

Date	Version	Changes
27-Apr-2020	1	Initial release.
04-May-2020	2	Updated Table 3. STSW-BLUENRG1-DK development kit compatibility matrix.
25-Sep-2020	3	Updated Table 3. STSW-BLUENRG1-DK development kit compatibility matrix. Added Section 1 STSW-BLUENRG1-DK, STSW-BNRG_V1-DK releases and main features, Section 3 Compatibility issues in specific use cases, Section 3.1 BOR_Config issue, Section 4 References, Section A.1 STSW-BLUENRG1-DK basic migration guidelines and Section A.2 STSW-BNRG_V1-DK basic migration guidelines.

## Contents

<b>1</b>	<b>STSW-BLUENRG1-DK, STSW-BNRG_V1-DK releases and main features</b>	<b>2</b>
<b>2</b>	<b>The BlueNRG-1, BlueNRG-2 development kit compatibility matrixes</b>	<b>3</b>
<b>3</b>	<b>Compatibility issues in specific use cases</b>	<b>5</b>
<b>3.1</b>	<b>BOR_Config issue.</b>	<b>6</b>
<b>4</b>	<b>References</b>	<b>7</b>
<b>Appendix A</b>		<b>8</b>
<b>A.1</b>	<b>STSW-BLUENRG1-DK basic migration guidelines</b>	<b>8</b>
<b>A.2</b>	<b>STSW-BNRG_V1-DK basic migration guidelines</b>	<b>8</b>
	<b>Revision history</b>	<b>9</b>

## List of tables

<b>Table 1.</b>	STSW-BLUENRG1-DK releases and main features . . . . .	2
<b>Table 2.</b>	STSW-BNRG-V1-DK releases and main features. . . . .	2
<b>Table 3.</b>	STSW-BLUENRG1-DK development kit compatibility matrix . . . . .	3
<b>Table 4.</b>	STSW-BNRG_V1-DK development kit compatibility matrix . . . . .	3
<b>Table 5.</b>	Device identification . . . . .	4
<b>Table 6.</b>	STSW-BLUENRG1-DK BOR_Config issue . . . . .	6
<b>Table 7.</b>	References . . . . .	7
<b>Table 8.</b>	Document revision history . . . . .	9

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