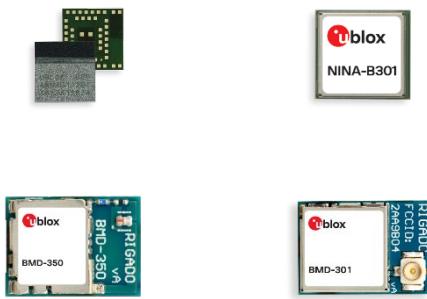


# Bluetooth® qualification process for nRF5 modules

## Bluetooth Low Energy

### Application note



## Abstract

This application note outlines the declaration process for end-products incorporating u-blox Bluetooth Low Energy modules based on Nordic Semiconductor nRF5 chipsets.

## Document information

<b>Title</b>	<b>Bluetooth® qualification process for nRF5 modules</b>	
<b>Subtitle</b>	Bluetooth Low Energy	
<b>Document type</b>	Application note	
<b>Document number</b>	UBX-20009220	
<b>Revision and date</b>	R01	4-Mar-2020
<b>Disclosure restriction</b>		

This document applies to the following products:

**Product name**

ANNA-B1

BMD-3

NINA-B1

NINA-B3

NINA-B4

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## Disclaimer

The information presented in this document is intended to provide a guide when generating Bluetooth SIG Declarations using u-blox Bluetooth Low Energy modules.

Final authority of these procedures falls within the Bluetooth SIG. A support request placed with the SIG may be required for specific declaration questions.

# 1 Bluetooth SIG

The Bluetooth Special Interest Group (SIG) is the standards organization that oversees the development of Bluetooth standards and the licensing of the Bluetooth technologies and trademarks to manufacturers. The organization cites the following mission statement [1]:

“In support of our vision and member companies, the Bluetooth SIG expands Bluetooth technology by fostering member collaboration to create new and improved specifications, drives global Bluetooth interoperability through a world class product qualification program, and grows the Bluetooth brand by increasing the awareness, understanding, and adoption of Bluetooth technology.”

## 1.1 Bluetooth SIG membership

All companies that use Bluetooth technology are required to join the Bluetooth SIG. The Bluetooth SIG offers two membership levels – with varying benefits. The basic, or Adopter Membership, is free to join. Refer to the Bluetooth SIG website [1] for the latest membership information.

Membership is at a corporate level. But to use the procedures outlined in this document, even individual employees of a company organization can and should obtain unique login credentials under the company membership.

## 1.2 Bluetooth specification

Bluetooth Core specifications are consolidated into a single version, which means that all new product declarations fall under the same specification at the time of their submission. A product is not required to support all features within the specification, but those features that are included must properly identified.

You can download the latest version of the specification from the Bluetooth website [1] – without a login.

## 1.3 Bluetooth qualification

To use Bluetooth trademarks and market devices that employ Bluetooth technology, the Bluetooth SIG requires all products that enable Bluetooth technology to be properly qualified and declared. In this way, the Bluetooth SIG is able to protect the brand and ensure that users enjoy a consistent experience. For end-products that use u-blox Bluetooth Low Energy modules, based on Nordic Semiconductor nRF5 chipsets, the process of qualification and declaration is simple.

See [4] for a link to the Bluetooth SIG website indicating current declaration fees.

## 1.4 Launch Studio website

Product declarations are submitted through the Bluetooth SIG Launch Studio website [2]. Membership login is required using the same credentials given for the Bluetooth website.

## 2 Declaration process

### 2.1 Qualified design categories

A brief summary of the different Bluetooth Qualified Design categories featured in this chapter is given below. For further about the design categorization and qualification process generally, visit the Bluetooth website.

All commercial products, subsystems and components that use Bluetooth technology must be fully qualified and listed as such with the Bluetooth End Product SIG. Qualification is limited to designs for the following product types:

- **End Products.** Independently functional Bluetooth devices based on pre-qualified Host and Controller Subsystems are classified as End Products. They might also include subsystems that are related to Protocols/Services/Profiles, or based on pre-qualified tested components that cover the layers in a functional independent Bluetooth device. For example, several u-blox customers utilize the Bluetooth technology qualified in the u-blox ANNA-B1, ANNA-B1 End Product designs listed under QDID 119389.
- **Subsystems.** There are three subcategories for Subsystems:
  - **Controller Subsystems.** Designs that must be combined with a complementary Host Subsystem in order to create the complete Bluetooth core architecture required for operation. For example, a USB commercial Bluetooth Dongle containing the RF-PHY and Link layer implementations, normally below the standardized HCI software and hardware interface of the Bluetooth stack. Several u-blox customers utilize Bluetooth technology included in u-blox JODY-W163-05A Controller Subsystem designs listed under QDID 114915.
  - **Host Subsystems.** Designs that must be combined with a complementary Controller Subsystem. For example, a Bluetooth stack and application software running in an Operating System or third-party software. Several u-blox customers utilize Bluetooth technology included in u-blox ODIN-2 Host Subsystem designs listed under QDID 40911.
  - **Profile Subsystems.** Designs that must be combined with a complementary End Product or Host Subsystem. For example, a product enhancement application implementing one or more of the adopted Bluetooth GATT profiles such as HID (human interface device) and DIS (device information service). Reference [3] is the adopted GATT profile page.
- **Components.** Designs without minimum layer support, but can include any layer or combination of layers. Combined components, or components that are combined with one or more subsystems, are necessary parts for creating a new End Product or Subsystem qualified designs. Qualified Components are usually specific layers, for example Nordic Semiconductor nRF52840 RF-PHY layer. These qualified layers can be used in a design. Consecutive performing tests are not required; however, a test plan with references to the components must be submitted. Several u-blox customers utilize Bluetooth technology included in u-blox BMD-345 Component designs listed under QDID 114712

### 2.2 QDID selection

Based on the features made available by the end-product, the identities of one or more corresponding Qualified Designs (QDID) can be referenced. Use the Launch Studio product search in order to obtain the most recent listings.

## 2.2.1 End Product QDID for u-connect

All end-products reference a single modular or CPU End Product QDID.

The u-blox ANNA and NINA series of modules are declared as modular End Products. For designs that use u-connect wireless connectivity software to integrate Bluetooth connectivity into new and existing end-products, include the u-blox End Product QDID under the Qualified Design section of the declaration. Figure 1 shows the QDID declaration details for the NINA-B3.

Declaration Details							
Listing Details							
Product		Product		Publish		Archive	Model
Name	Website	Category		Date		Date	Number
NINA-B30 series		Unique Products		2018-09-14		NINA-B30 series	The NINA-B30 series are open CPU modules that enable customer ...
NINA-B31 series		Unique Products		2018-09-14		NINA-B31 series	The NINA-B31 series modules includes u-blox connectivity software which provides ...

Note: Products that have not yet completed the Bluetooth Qualification Process will not appear in public search results.							
<b>Qualified Design:</b>							
QDID 118016							
TCRL Version TCRL 2017-2							
Product Type End Product							
Combined Designs 104470 (Component (Tested)), 106843 (Component (Tested)), 111593 (Component (Tested))							
Design Name NINA-B3 series							
Design Model Number NINA-B3							
Design Description The NINA-B3 series modules are small stand-alone Bluetooth 5 low energy modules featuring full Bluetooth 5 support, a powerful Arm® Cortex®-M4 with FPU, and state-of-the-art power performance. The embedded low power crystal improves power consumption by enabling optimal power save modes.							
Hardware Version Number 03 / 05							
Software Version Number RF5_SDK_15.0.0_a53641a							
Core Specification 5.0							
Other References							
<a href="#">View ICS Details</a>		<a href="#">Export ICSs</a>					

Figure 1: NINA-B3 QDID listing

## 2.2.2 End Product QDID for open CPU

The declaration for an end-product incorporating an open CPU module must refer to an End Product QDID that refers to the same version of the SoftDevice. This is checked by looking under the “Combined Designs” section of the QDID.

### 2.2.2.1 Example 1: u-blox NINA-B30, SoftDevice S140 v6.1.0

Using the same listing as above, select each of the Component QDIDs listed in the Combined Designs line as shown in Figure 2.

**Declaration Details**

**Listing Details**

Declaration ID	D041004
Referenced Qualified Designs	
Company	u-blox AG
Listing Date	2018-09-14
Specification Name	5.0
Wi-Fi Certification ID	
Reference Integration Notes (RIN)	No Files Uploaded

**Product List**

Product Name	Product Website	Product Category	Publish Date	Archive Date	Model Number	Subset ID	Description
NINA-B30 series	Unique Products		2018-09-14		NINA-B30 series		The NINA-B30 series are open CPU modules that enable customer ...
NINA-B31 series	Unique Products		2018-09-14		NINA-B31 series		The NINA-B31 series modules includes u-blox connectivity software which provides ...

Note: Products that have not yet completed the Bluetooth Qualification Process will not appear in public search results.

**Qualified Design:**

QDID	118016
TCRL Version	TCRL 2017-2
Product Type	End Product
Combined Designs	<a href="#">104470 (Component (Tested))</a> , <a href="#">106843 (Component (Tested))</a> , <a href="#">1111593 (Component (Tested))</a>
Design Name	NINA-B3 series
Design Model Number	NINA-B3
Design Description	The NINA-B3 series modules are small stand-alone Bluetooth 5 low energy modules featuring full Bluetooth 5 support, a powerful Arm® Cortex®-M4 with FPU, and state-of-the-art power performance. The embedded low power crystal improves power consumption by enabling optimal power save modes.
Hardware Version Number	03 / 05
Software Version Number	RF5_SDK_15.0.0_a53641a
Core Specification	5.0
Other References	
<a href="#">View ICS Details</a>	<a href="#">Export ICSs</a>

Figure 2: NINA-B30 open CPU example

Inspect each one to find the referenced SoftDevice. In this case, the SoftDevice version is v6.1.x.

#### Product List

Product Name	Product Website	Product Category	Publish Date	Archive Date	Model Number	Subset ID	Description
Host layer for SoftDevice S140	www.nordicsemi.no	Software	2018-07-06		nRF52 Host v6.1.0		Host layer portion of the Nordic S140 SoftDevice. Designed to ...

#### Product List

Product Name	Product Website	Product Category	Publish Date	Archive Date	Model Number	Subset ID	Description
S140 Link Layer Component	www.nordicsemi.no	Software	2018-07-18		S140 Link Layer 6.1.x		Link Layer for the S140 SoftDevice Bluetooth Stack. The S140 ...

#### Product List

Product Name	Product Website	Product Category	Publish Date	Archive Date	Model Number	Subset ID	Description
nRF52840	www.nordicsemi.com	Unique Products	2018-02-01		nRF52840 AQFN73		The nRF52840 is an advanced, highly flexible single chip solution ...

Figure 3: SoftDevice version inspection

☞ The Host and Link Layers should reference the same version. The RF PHY QDID is not critical. Since the end-product is incorporating this combination the u-blox QDID 118016 is used.

#### 2.2.2.2 Example 2: NINA-B30 or BMD-34, SoftDevice S140 v7.0.1

If the NINA-B30 or BMD-34 is used in conjunction with S140 v7.0.1, the Nordic Semiconductor QDID must be used. Perform an advanced search with “Nordic Semiconductor ASA” in the company field, “S140” in the search box, and select “End Product” for product type:

Declaration ID	QDID(s)	Company	Products	Specification Name	Listing Date
D047621	138767 - End Product	Nordic Semiconductor ASA	nRF52 Series with SD S140 v7.0.1, 5.1 nRF52 - S140		2019-09-13
D038372	124988 - End Product	Nordic Semiconductor ASA	nRF52840 with S140 v6.1.1, nRF52 5.0 - S140 v6.1.1 nRF52840 with S140 v7.x.x, nRF52840 - S140 v7.x.x		2019-01-28
D040755	115277 - End Product	Nordic Semiconductor ASA	nRF52840 with S140 v6.1.x, nRF52 5.0 - S140 v6.1.x		2018-07-30
D038621	108621 - End Product	Nordic Semiconductor ASA	nRF52840 with S140 v6.0.0, 5.0 nRF52840		2018-03-02

Figure 4: QDID search

The end-product declaration then uses QDID 138767.

☞ When more than one entry matches, use the most recent one.

Table 1 lists the possible combinations of module, nRF5 CPU, and SoftDevices. Only one combination is valid for the final end-product declaration.

u-blox module	nRF5 CPU	Possible SoftDevices (* most common selection)
ANNA-B1	nRF52832	S112, S132*
BMD-30	nRF52832	S112, S132*
BMD-33	nRF52810	S112*, S132
BMD-34	nRF52840	S112, S132, S140*
BMD-35	nRF52832	S112, S132*
BMD-36	nRF52811	S112, S113*, S140
BMD-38	nRF52840	S112, S132, S140*
NINA-B10	nRF52832	S112, S132*
NINA-B30	nRF52840	S112, S132, S140*
NINA-B40	nRF52833	S113, S140

Table 1: u-blox module, nRF5 CPU, and SoftDevices

 Nordic Semiconductor uses Subsystem declarations for the Host and Link Layers based on the same code base. The underlying Component QDIDs may all refer to S140.

If no additional features beyond those available in the SoftDevice are included, only the module or CPU End Product QDID is needed.

### 2.2.3 Profile subsystem

If the end-product includes an adopted Generic Attribute (GATT) profiles or services, such as the HID (human interface device) and DIS (device information service), then one or more profile subsystems must also be selected for the end-product submission. A list of current GATT profiles is maintained at the Bluetooth SIG website [3].

To find the correct profile subsystem, select an advanced search and limit the listings to profile subsystems for Nordic Semiconductor, as shown in Figure 5.

Advanced Search ▾

Search By Project Type

Qualifications With Required Testing  
 Qualifications With No Required Testing  
 End Product Listings (EPLs < 2/1/2014)  
 Qualified Product Listings (PRD 1.0)

Company

Nordic Semiconductor ASA  
 My Company

Product Type: Profile Subsystem  
Spec Name: NONE  
Layers:  
 3DSP  
 4.0HCI  
 80211 MAC-PHY  
 80211PAL  
 A2DP  
 A2MP  
 AIOP  
 AIOS

Listing Date  
From: YYYY-MM-DD  
To: YYYY-MM-DD

Search... 🔍 Reset

Declaration ID	QDID(s)	Company	Products	Specification Name	Listing Date
D047618	139977 - Profile Subsystem	Nordic Semiconductor ASA	nRF5 SDK for Mesh v3.2.0, 3.2.0	N/A	2019-10-16
D039781	111537 - Profile Subsystem	Nordic Semiconductor ASA	nRF5 SDK for MESH, nRF5 SDK for Mesh v2.0.1	N/A	2018-05-02
D036591	100032 - Profile Subsystem	Nordic Semiconductor ASA	nRF52 DK, nRF52 DK - IPSP	5.0	2017-09-04
D027550	70915 - Profile Subsystem	Nordic Semiconductor ASA	nRF51 SDK - Tim: Profile subsystem	4.2	2015-07-10
D024167	60576 - Profile Subsystem	Nordic Semiconductor ASA	nRF51 SDK Heart Rate Profile	N/A	2014-09-30
B021770	49943 - Profile Subsystem	Nordic Semiconductor ASA	multiprofile subsystem for nRF5x	N/A	2013-10-29
B021213	45222 - Profile Subsystem	Nordic Semiconductor ASA	Nordic multi-profile subsystem Added SoftDevice versions S112, S113, S140, SD variants S112 - S113 - S140	N/A	2013-06-26
B020820	44613 - Profile Subsystem	Nordic Semiconductor ASA	HID over GATT profile subsystem Added SoftDevice versions S112, S113, S140, SD variants S112 - S113 - S140	N/A	2013-04-05
B018844	33493 - Profile Subsystem	Nordic Semiconductor ASA		N/A	2011-12-02

**Figure 5: Profile subsystem search for Nordic Semiconductor ASA**

☞ Each of these listings cover different subsystems. Ensure the correct one is selected. For example, the DIS service mentioned earlier uses profile subsystem QDID 44613, as shown in Figure 6. Again, make sure that the correct SoftDevice is referenced.

Declaration Details						
Listing Details						
Declaration ID	B020820					
Referenced Qualified Designs						
Company	Nordic Semiconductor ASA					
Listing Date	2013-04-05					
Specification Name	N/A					
Wi-Fi Certification ID						
Reference Integration Notes (RIN)	<a href="#">Download</a>					
Product List						
Product Name	Product Website	Product Category	Publish Date	Archive Date	Model Number	Subset ID Description
	www.nordicsemi.no	Unique Products	2016-06-15		HID over GATT profile subsystem	As part of the Software Development Kit for Nordic's nRF5x ...
Added SoftDevice versions S112, S113, S140	www.nordicsemi.com	Software	2019-08-09		SD variants S112 - S113 - S140	This is a version update to the HID over GATT ...
Note: Products that have not yet completed the Bluetooth Qualification Process will not appear in public search results.						
Qualified Design:						
QDID	44613					
TCRL Version	TCRL 2012-3 (CSA4)					
Product Type	Profile Subsystem					
Combined Designs						
Design Name	nRF51 SDK					
Design Model Number	S110 HOGP Profile subsystem					
Design Description	HID over GATT profile subsystem for the Nordic S110, S120, S130 and S132 SoftDevices and the nRF5x series SOC devices. This subsystem also includes the Device Information Service, Battery Service and HID Service. Also valid for S310/S330/S332 SoftDevices from Dynastream.					
Hardware Version Number	n/a					
Software Version Number	4.0.0					
Core Specification	N/A					
Other References						
<a href="#">View ICS Details</a>	<a href="#">Export ICSS</a>					

**Figure 6: Profile subsystem QDID for DIS**

## 2.3 Declaration process

With the QDIDs selected, the declaration process can be started. From the “Getting Started” tab of the Launch Studio main page, select the “No Required Testing” path, as shown in Figure 7.

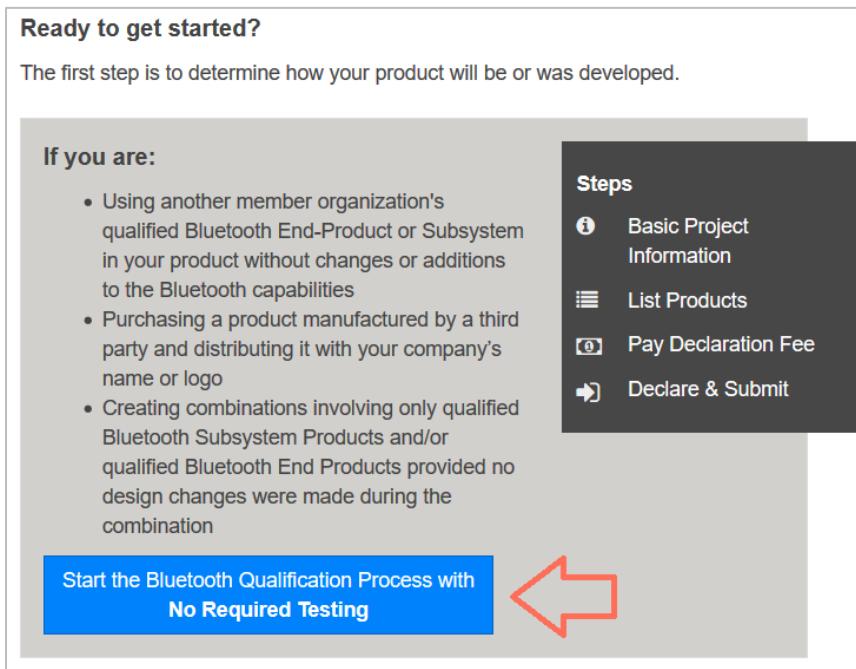
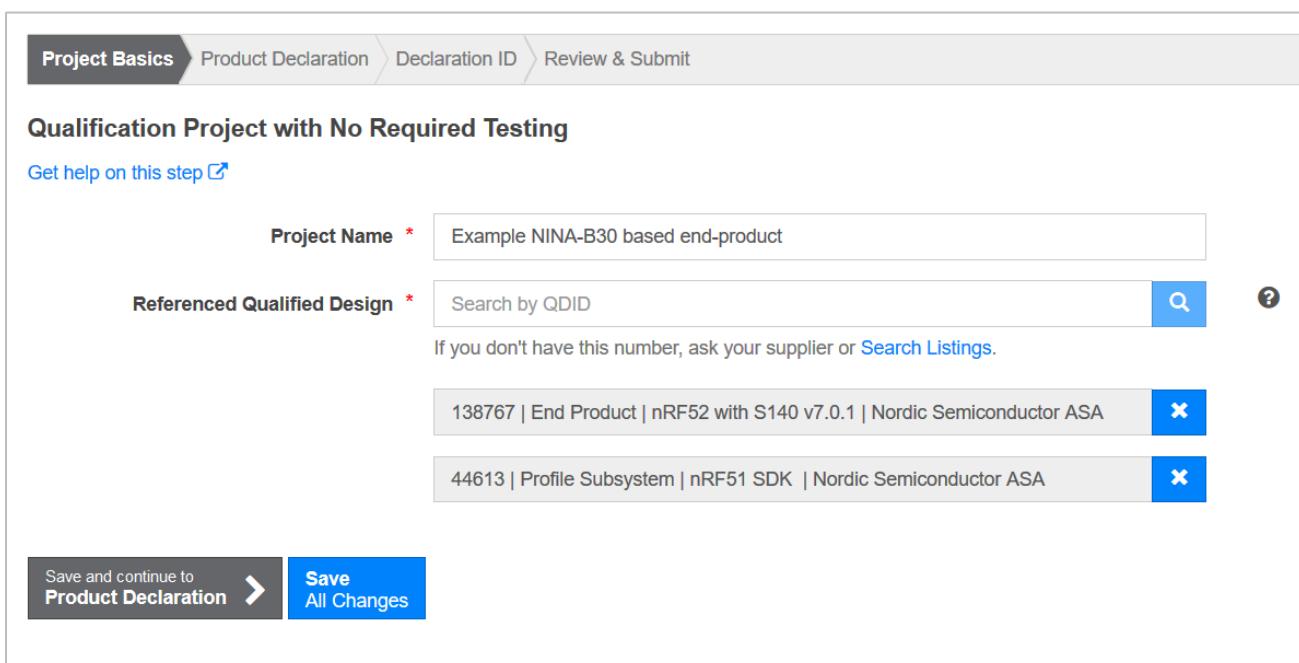


Figure 7: Launch Studio "No Required Testing"

### 2.3.1 Product basics

Give the end-product a name and enter the QDIDs selected in Section 2.1. Figure 8 shows the example entries selected above for use with a NINA-B30 using SoftDevice v7.0.1 and the DIS profile.



The screenshot shows the 'Project Basics' step in Launch Studio. The top navigation bar shows 'Project Basics' as the active tab, followed by 'Product Declaration', 'Declaration ID', and 'Review & Submit'. The main section is titled 'Qualification Project with No Required Testing' and includes a 'Get help on this step' link. Below this, there are two input fields: 'Project Name \*' with 'Example NINA-B30 based end-product' and 'Referenced Qualified Design \*' with a search bar containing 'Search by QDID'. Below the search bar is a note: 'If you don't have this number, ask your supplier or [Search Listings](#)'. Two QDID entries are listed: '138767 | End Product | nRF52 with S140 v7.0.1 | Nordic Semiconductor ASA' and '44613 | Profile Subsystem | nRF51 SDK | Nordic Semiconductor ASA', each with a delete icon. At the bottom are buttons for 'Save and continue to Product Declaration' and 'Save All Changes'.

Figure 8: New project with QDIDs entered

Select the “Save and continue to Product Declaration” button to continue the process.

### 2.3.2 Product declaration

#### Example NINA-B30 based end-product

Project Basics **Product Declaration** Declaration ID Review & Submit

#### Product Declaration

Begin the Declaration Process phase of product qualification by describing each of your product(s) that implement Bluetooth technology.

[Get help on this step](#)

**Listing Date \*** 2020-04-30

#### Product Listing

List all Products that use this Design (or combination of Designs) and that are distributed under a name that identifies your company as the source of the Product. Please refer to the [Bluetooth Launch Studio Terms of Use](#) for the definition of "Product." Color variations are not considered as separate Product. Any other change (e.g., form factor, model name, Design, etc.) is considered a separate Product. All Products must complete the Qualification Process by adding a separate Product listing. Certain changes to the Design portion of a Product will require a new Design qualification and Declaration ID (as set forth in the [Bluetooth Qualification Program Reference Document \(PRD\)](#)).

Bluetooth SIG maintains a publicly available database of information submitted through Launch Studio. Customs officials often use the database to identify unlicensed Bluetooth products. If a product implements Bluetooth technology or bears the Bluetooth® trademark and it is not listed in Bluetooth SIG's database, customs officials may seize or block the import of the product. You can delay the inclusion of certain information about your product in the publicly available database for up to 90 days after you submit your project (see [Bluetooth Launch Studio Terms of Use](#), Section 5) by selecting a Publish Date in the "Add a Product" modal up to 90 days after the date you submit your project.

[+ Add a Product](#)

Product Name	Product Website	Product Category	Publish Date	Arch

[Save and return to Project Basics](#) [Save and continue to Declaration ID](#) [Save All Changes](#)

Figure 9: Product addition

Select “Add a Product” and complete the form.

**Add/Edit products**

<b>Product Full Name *</b> (Including Trademark)	Example NINA-B30 product
<b>Category</b>	Home Environment
<b>Product Website</b>	example-website.com
<b>Publish Date *</b>	2020-04-30
Certain product information becomes visible to the public in Bluetooth SIG's database at 00:00 UTC±00:00 Coordinated Universal Time (UTC) on the Publish Date you select. The Publish Date must be on or after the Listing Date, but no later than 90 days from the date this project is submitted.	
<b>Description *</b>	Example showing declaration process
<b>Model Number *</b>	EXAMPLE-NINA-B30-123456
<b>Cancel</b> <b>Save</b>	

**Figure 10: Product details**

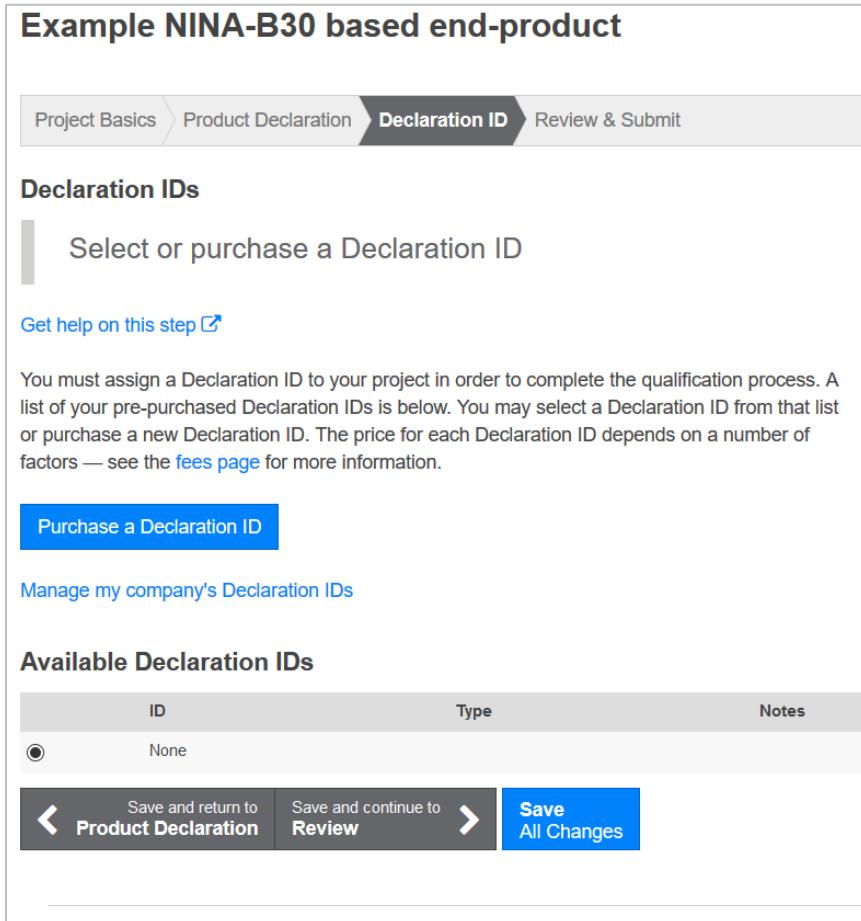
 On the Product Declaration page, enter a listing date. This may be up to 90 days in the future in order to prevent any public listing until that time.

Save the new product, then select “Save and continue to Declaration ID”.

### 2.3.3 Declaration ID

A Declaration ID is required to continue. Follow the link to purchase an ID. Pricing is dependent on the membership level. See the declaration fees page [4] for the latest information.

**Example NINA-B30 based end-product**



Project Basics Product Declaration Declaration ID Review & Submit

**Declaration IDs**

Select or purchase a Declaration ID

Get help on this step ↗

You must assign a Declaration ID to your project in order to complete the qualification process. A list of your pre-purchased Declaration IDs is below. You may select a Declaration ID from that list or purchase a new Declaration ID. The price for each Declaration ID depends on a number of factors — see the [fees page](#) for more information.

[Purchase a Declaration ID](#)

[Manage my company's Declaration IDs](#)

**Available Declaration IDs**

ID	Type	Notes
None		

Save and return to **Product Declaration** Save and continue to **Review** Save All Changes

**Figure 11: Declaration ID**

After selecting an available Declaration ID, select “Save and continue to Review”.

### 2.3.4 Review and submission

At this point, all information required for the declaration is ready. Review the information to make sure it is correct and submit the declaration for listing.

# Appendix

## A Glossary

Abbreviation	Definition
Bluetooth SIG	Bluetooth Special Interest Group
CPU	Central Processing Unit
DIS	Device Information Service
End-product	The product being declared with the Bluetooth SIG
End Product QDID	The QDID listing associated with the u-blox module or nRF5 CPU The QDID that is the result of this process for the end-product
GATT	Generic Attribute Profile
QDID	Qualified Declaration Identification
SoftDevice	Nordic Semiconductor Bluetooth stack

Table 2: Explanation of the abbreviations and terms used

## Related documents

- [1] [Bluetooth SIG website](#)
- [2] [Bluetooth Launch Studio website](#) (login required)
- [3] [Bluetooth GATT profiles](#)
- [4] [Bluetooth SIG Declaration ID fees page](#)

 For regular updates to u-blox documentation and product change notifications, register on our homepage ([www.u-blox.com](http://www.u-blox.com)).

## Revision history

Revision	Date	Comments
R01	04-Mar-2020	Initial release

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