



Bluetooth LE Chip SDK

Hardware Product Development > IoTOS Pro-Code Development >

Module SDK Development Access > Bluetooth LE Chip SDK

Version: 20210318

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Bluetooth Low Energy (Bluetooth LE) chip SDK development is a common SDK development method for various Bluetooth LE smart products. This topic describes how to implement custom Bluetooth LE chip SDK development on the [Tuya IoT platform](#). This custom solution applies to product development with a Bluetooth LE chip SDK.

1 Description

Bluetooth LE chip SDK development supports the following cloud connection modes: **Tuya Standard Module MCU SDK** and **Self-developed Module SDK**. These modes support the following features:

- **Tuya Standard Module MCU SDK**

In this mode, network modules are used for SDK development. For more information, see [Network Modules](#). Tuya production systems can be used to produce this type of module. You can upload your production firmware to the [Tuya IoT Platform](#). Tuya flashes the firmware to the required module and authorizes the module. Then, you can use this module in the Bluetooth LE chip SDK development.

- **Self-developed Module SDK**

In this mode, the modules cannot be produced by Tuya production systems. You must purchase chips and tokens on the [Tuya IoT Platform](#) and implement firmware flashing and module authorization.

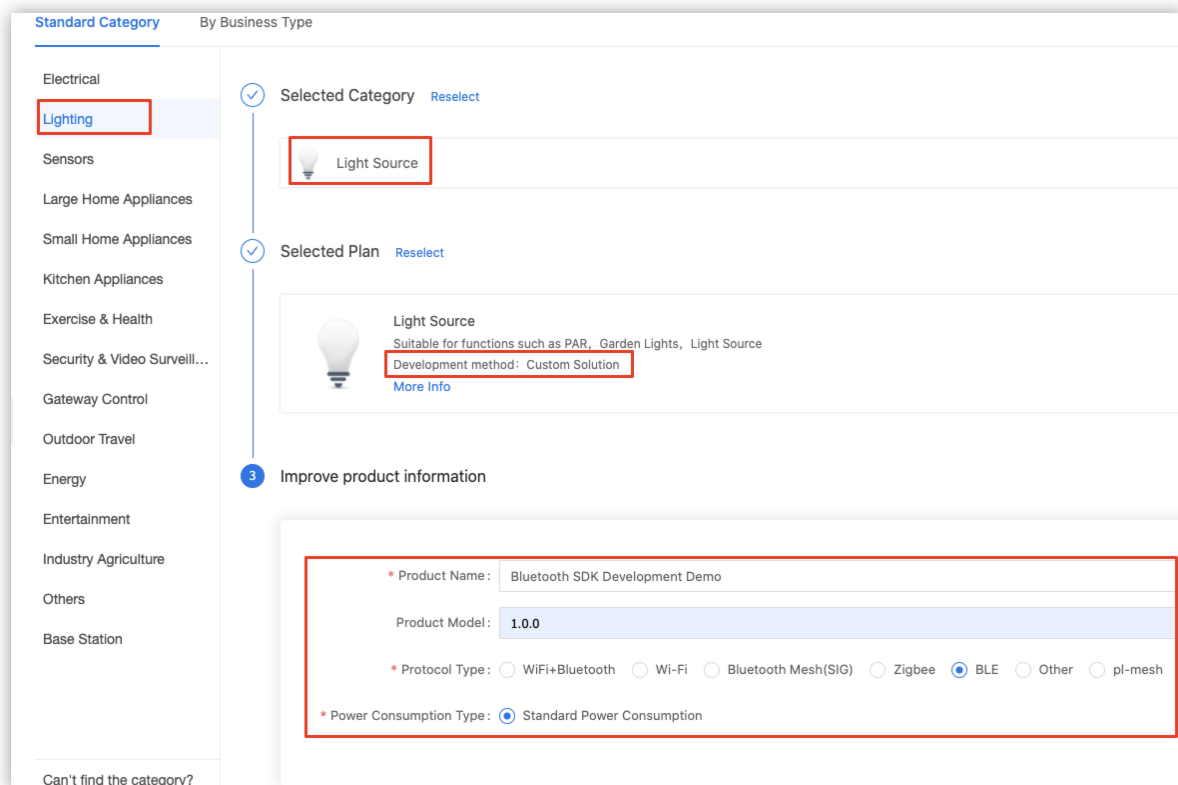
Note: The **Self-developed Module SDK** mode is available to only the accounts in the whitelist. To add your account to the whitelist and enable this mode, [submit a ticket](#) to request technical support.

2 Procedure

The **Tuya Standard Module MCU SDK** and **Self-developed Module SDK** modes follow similar development steps. To implement the **Self-developed Module SDK** mode, perform the following steps:

2.1 Step 1: Create a product

1. Log in to the [Tuya IoT Platform](#), select the preferred category, set **Development method** to **Custom Solution**, and then enter the required product information. For more information, see [Create Products](#).



The screenshot displays the Tuya IoT Platform product creation interface. On the left, a sidebar lists various categories under 'Standard Category' and 'By Business Type'. The 'Lighting' category is selected. The main area shows the 'Selected Category' as 'Lighting' and 'Selected Plan' as 'Light Source'. The 'Development method' is set to 'Custom Solution'. The 'Improve product information' section is highlighted with a red box, showing the following fields:

- * Product Name: Bluetooth SDK Development Demo
- Product Model: 1.0.0
- * Protocol Type: ☐ WiFi+Bluetooth ☐ Wi-Fi ☐ Bluetooth Mesh(SIG) ☐ Zigbee ☒ BLE ☐ Other ☐ pl-mesh
- * Power Consumption Type: ☒ Standard Power Consumption

2. Set data points (DPs) based on the required product functions. The DPs are classified into standard DPs and custom DPs. You can select the DPs to meet your business requirements.

For more information, see [Function Definition](#).

Bluetooth SDK Development Demo

Change product

Developing Product Release

Custom PID: hcwn1u78 Category: Light Source Protocol Type: BLE

Function Definition Device Panel Hardware Development Product Configuration Device Commissioning Test Services

Export Function How to define product features?

Standard Functions + Create Functions

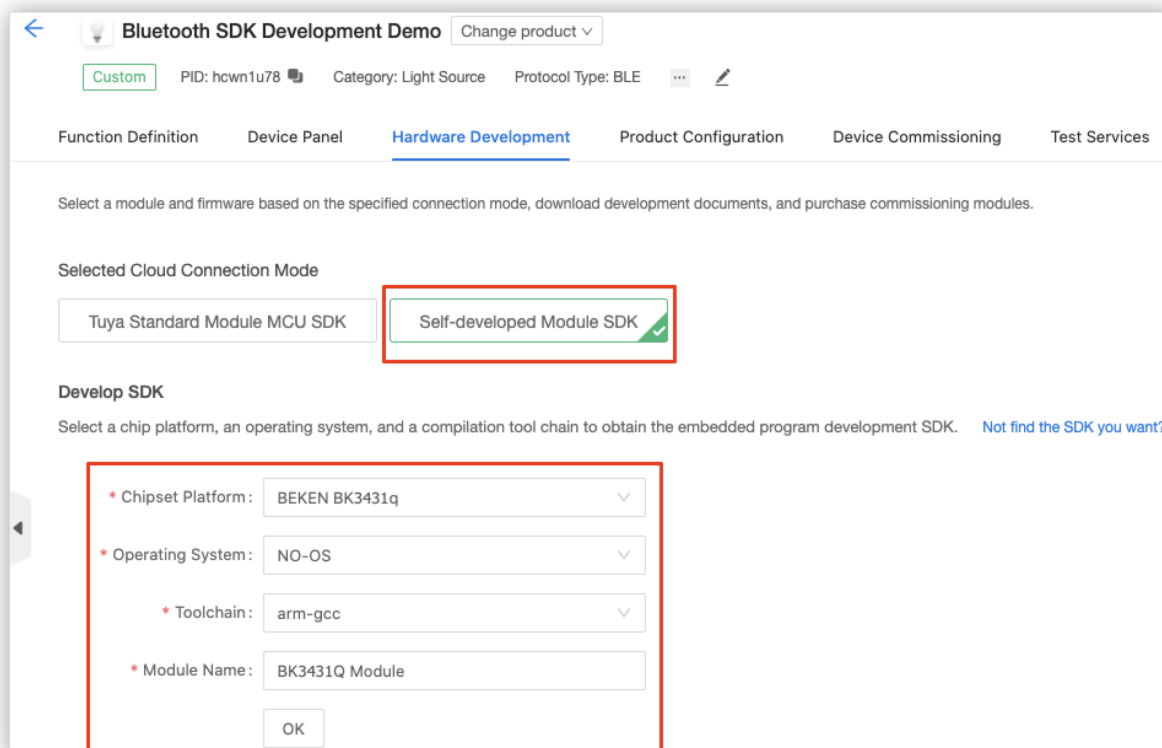
DP ID	Function points	Identifier	Data type	Function type	Properties	Operate
1	ON/OFF	switch_led	Issue and report	Boolean		Edit Delete
2	Mode	work_mode	Issue and report	Enum	Enumerated values:white, colour, scene, music	Edit Delete
3	Brightness	bright_value	Issue and report	Integer	Values range:10-1000, Pitch1, Scale0, Unit:	Edit Delete
4	Color Temp	temp_value	Issue and report	Integer	Values range:0-1000, Pitch1, Scale0, Unit:	Edit Delete
5	Color	colour_data	Issue and report	Char type		Edit Delete
6	Scene	scene_data	Issue and report	Char type		Edit Delete
7	Timer	countdown	Issue and report	Integer	Values range:0-86400, Pitch1, Scale0, Unit:	Edit Delete
8	Music	music_data	Only issue	Char type		Edit Delete
9	Adjustment	control_data	Only issue	Char type		Edit Delete
34	Do not disturb	do_not_disturb	Issue and report	Boolean		Edit Delete
37	Off-line timer	rtc_timer	Issue and report	RAW type		Edit Delete

Custom Functions + Create Functions



2.2 Step 2: Download documents

1. In the **Hardware Development** step, specify **Self-developed Module SDK** as the cloud connection mode, set the SDK development parameters, and then download the required SDK and demo.

Note: The **Tuya Standard Module MCU SDK** mode is in the beta stage. To enable this mode, [submit a ticket](#) to request technical support.




Bluetooth SDK Development Demo Change product v

Custom PID: hcwn1u78  Category: Light Source Protocol Type: BLE ... 

Function Definition Device Panel **Hardware Development** Product Configuration Device Commissioning Test Services

Select a module and firmware based on the specified connection mode, download development documents, and purchase commissioning modules.

Selected Cloud Connection Mode

Tuya Standard Module MCU SDK Self-developed Module SDK 

Develop SDK

Select a chip platform, an operating system, and a compilation tool chain to obtain the embedded program development SDK. [Not find the SDK you want?](#)

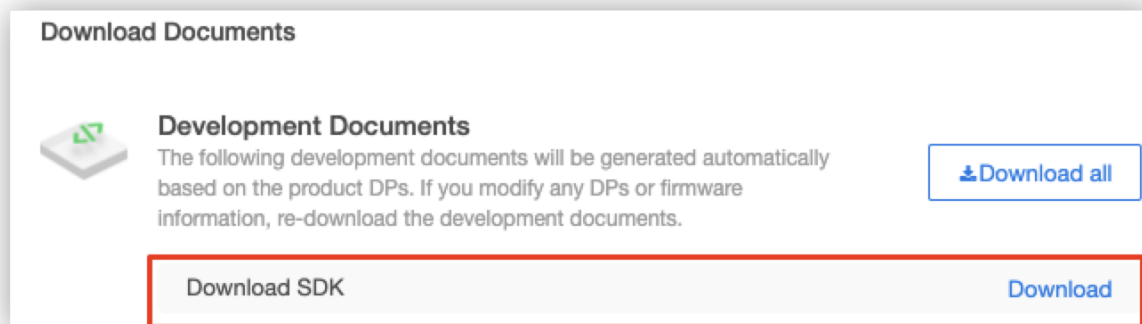
* Chipset Platform: BEKEN BK3431q v

* Operating System: NO-OS v


* Toolchain: arm-gcc v

* Module Name: BK3431Q Module

OK



Download Documents

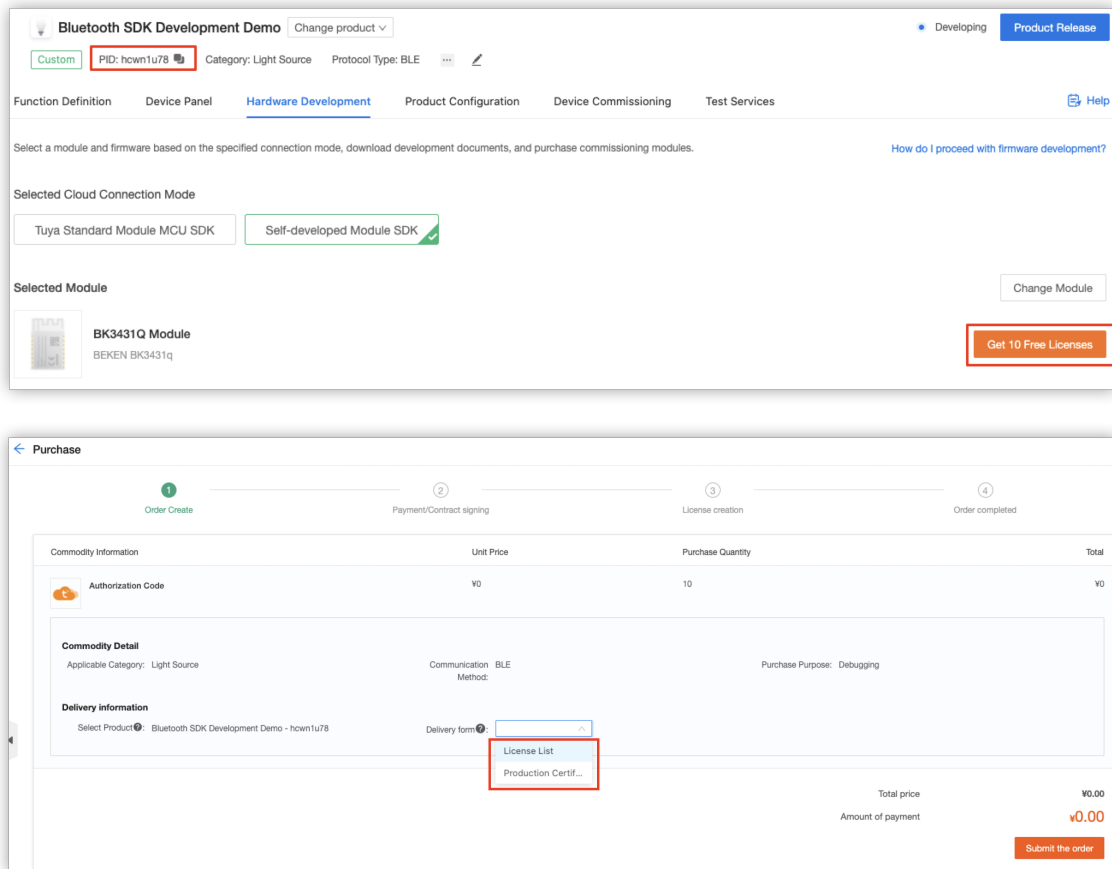
 **Development Documents**

The following development documents will be generated automatically based on the product DPs. If you modify any DPs or firmware information, re-download the development documents.

Download all

Download SDK Download

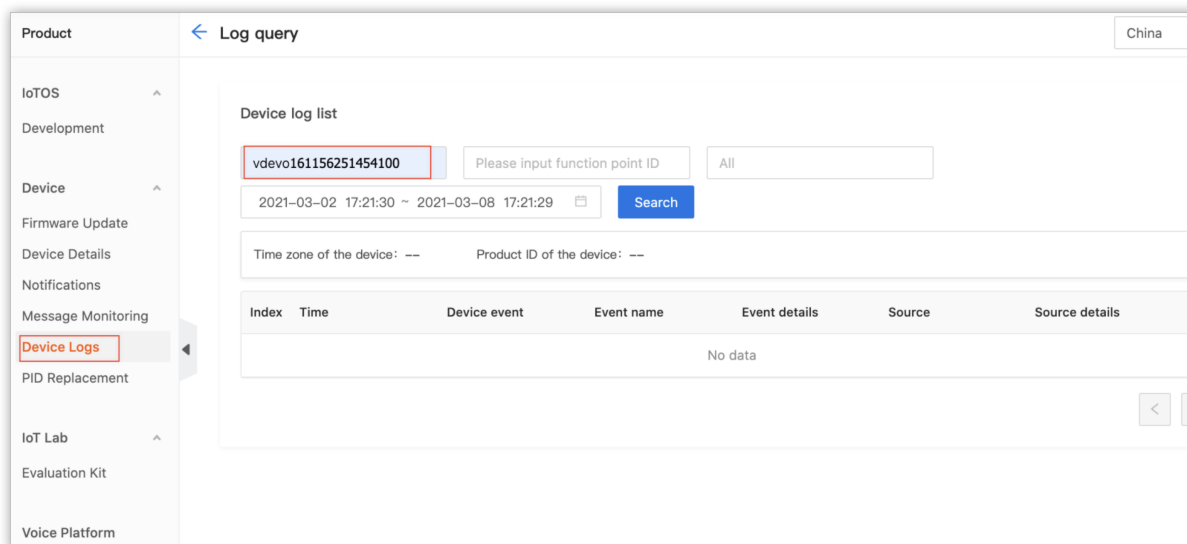
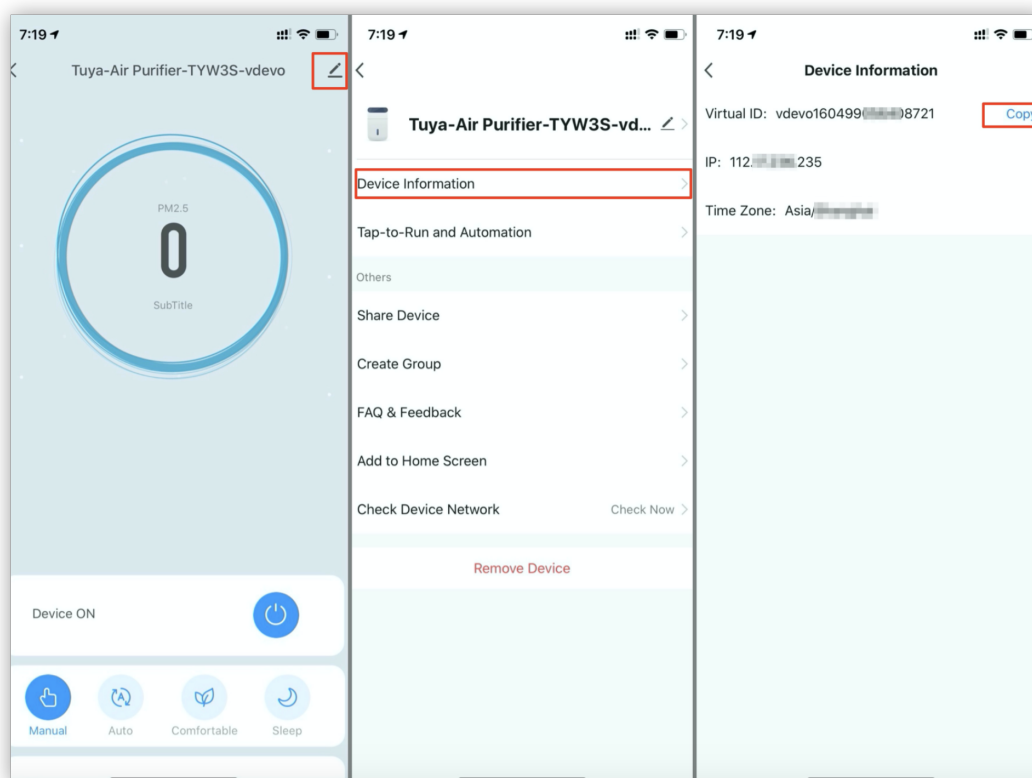
2. Apply for the authorization code for testing and debugging. Select the delivery form that supports the specified flashing method. In this example, the BK3431Q module is used. Click **Get 10 Free Licenses** to open the **Purchase** wizard and choose **License List** from the **Delivery form** drop-down list. A license list is the authorization plaintext and used to flash firmware for BK343X chips. A production certificate is an independent authorization token and applies to authorization for Tuya modules and host software.



The screenshot displays the 'Bluetooth SDK Development Demo' interface. The top navigation bar includes 'Custom', 'PID: hcn1u78', 'Category: Light Source', 'Protocol Type: BLE', and 'Change product'. The main section is titled 'Hardware Development' and contains a 'Selected Cloud Connection Mode' section with 'Tuya Standard Module MCU SDK' and 'Self-developed Module SDK' (selected). Below this is the 'Selected Module' section showing the 'BK3431Q Module' (BEKEN BK3431q) and a 'Get 10 Free Licenses' button. The bottom section is the 'Purchase' flow, which includes a progress bar with four steps: 'Order Create', 'Payment/Contract signing', 'License creation', and 'Order completed'. The 'Commodity Information' table shows 'Authorization Code' with a unit price of ¥0 and a purchase quantity of 10. The 'Commodity Detail' section shows 'Applicable Category: Light Source', 'Communication: BLE', and 'Purchase Purpose: Debugging'. The 'Delivery information' section shows 'Select Product: Bluetooth SDK Development Demo - hcn1u78' and a 'Delivery form' dropdown menu with options 'License List' and 'Production Certif...'. The bottom right corner shows the 'Total price' as ¥0.00 and the 'Amount of payment' as ¥0.00, with a 'Submit the order' button.

2.3 Step 3: Debug the SDK

1. The downloaded SDK contains the app demo that can guide your SDK development. For more information, see [Bluetooth LE SDK Demo Overview](#).
2. During the debugging, troubleshoot issues based on device logs. Tuya provides the following logs to support your debugging:
 - Local logs: the logs that are generated on local devices. For more information, see the SDK development documentation.
 - Cloud logs: the logs of communication between devices and the cloud. To query the logs, in the left-side navigation pane of the [Tuya IoT Platform](#), choose **Product** > **Device Logs** to go to the **Log query** page, and enter the virtual device ID that is found on your app.

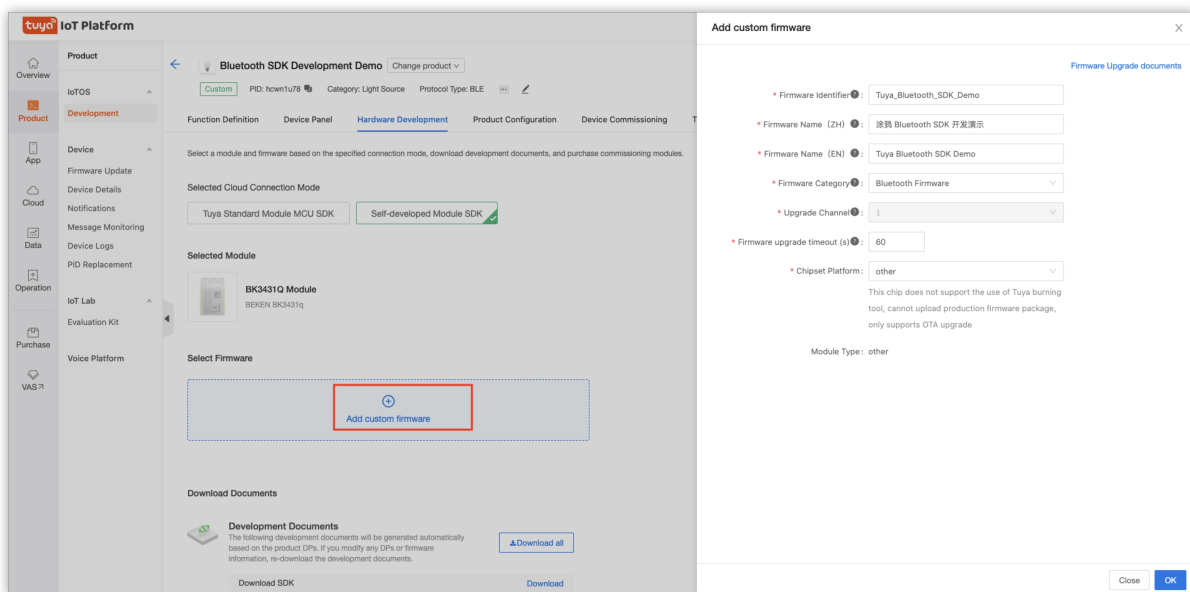


2.4 Step 4: Verify the firmware

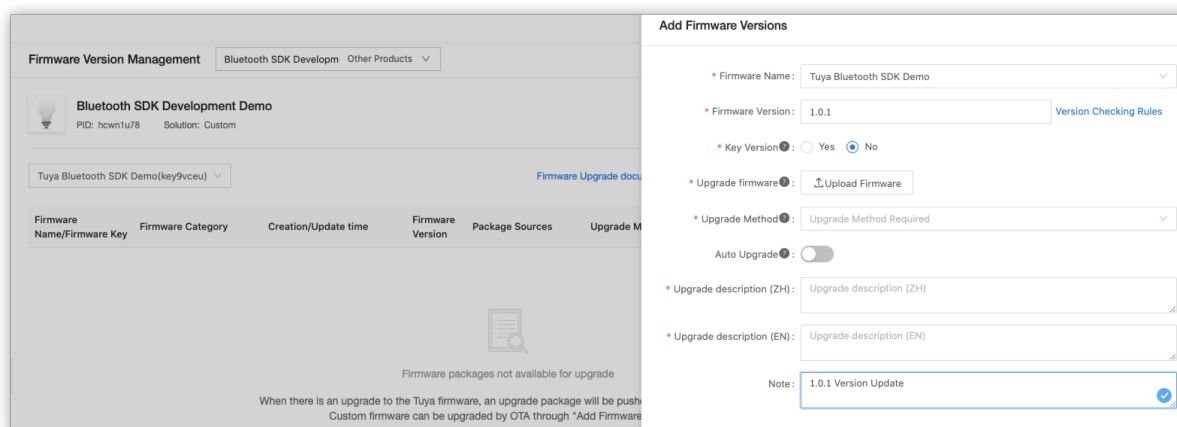
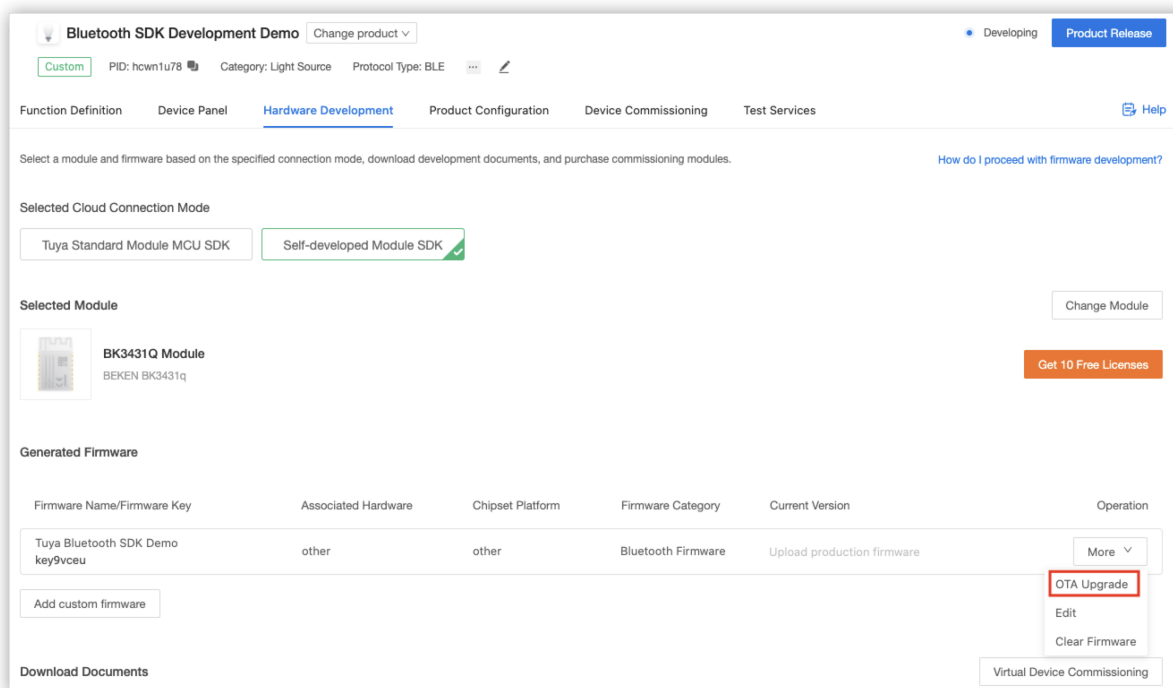
After the firmware that is developed based on the self-developed module SDK passes the functional test, you must upload the firmware to the [Tuya IoT Platform](#) and apply

for the mass product authorization code to enable the test service provided by Tuya. Perform the following steps:

1. On the **Hardware Development** tab, click **Add custom firmware**. In the pane that appears, enter the firmware information, set **Firmware Identifier** to the name of the built firmware, and then set **Firmware Category** to **Bluetooth Firmware** for a Bluetooth LE product. Then, click **OK**.



2. In the **Generated Firmware** section, select the **OTA Upgrade** operation. In the **Add Firmware Versions** pane, enter the required firmware version information, upload the built firmware, and then click **Confirm**. For more information, see [Update Firmware](#).



2.5 Step 5: Release the product and enable mass production

Go to the **Test Services** tab, follow the instructions to test the product functions with the Tuya Cloud Test app, upload the test report, and then click **Product Release**. The released product is in the **Developed** state and ready for mass production.

Bluetooth SDK Development Demo

Change product

Developing

Product Release

Custom

PID: hown1u78

Category: Light Source

Protocol Type: BLE

Function Definition

Device Panel

Hardware Development


Product Configuration

Device Commissioning

Test Services


Help

To ensure product quality and user experience, make sure the product has been thoroughly tested and select a qualified report (Tuya Cloud Test in-depth testing with 100% pass rate/self-test pass report).




Editing Use Cases

DownloadLight SourceCategory Use Cases,
[download](#)




Confirmation Use Cases

Select the appropriate use case based on
product information



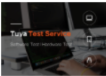
Test Product

Follow the use case prompts to complete the
test



Upload product test reports

[Upload Report](#)



Don't want to test by yourself? Tuya Test Service is available

Tuya's professional testing team provides you with high quality testing services, freeing you from the massive testing work and improving your work efficiency.

[More Detail](#)

3 References

- [Sandwich Evaluation Kits](#)
- [Demo Center](#)
- [Update Firmware](#)