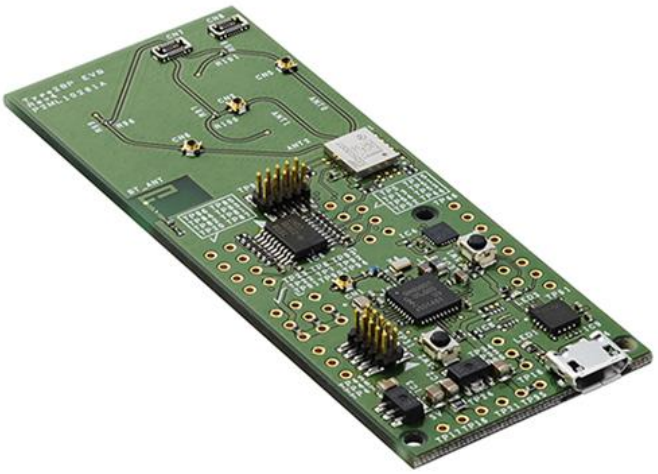
User Guide

Type 2BP UWB Module EVK

How to Build Pre-Built Binary - Rev. 4.0C



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About This Document

This document provides steps to build pre-built binary for Type 2BP EVK.

Audience & Purpose

This guide is for developers and RF engineers who will develop software on Murata Type 2BP EVK.

Document Conventions

Table 1 describes the document conventions.

Table 1: Document Conventions

Conventions	Description
	**Warning Note** Indicates very important note. Users are strongly recommended to review.
	**Info Note** Intended for informational purposes. Users should review.
	**Menu Reference** Indicates menu navigation instructions. **Example**: Insert➔Tables➔Quick Tables➔Save Selection to Gallery 
	**External Hyperlink** This symbol indicates a hyperlink to an external document or website. **Example**: Type 2BP Product Page  Click on the text to open the external link.
	**Internal Hyperlink** This symbol indicates a hyperlink within the document. **Example**: Differences Between SDK Versions  Click on the text to open the link.
`Console input/output or code snippet`	**Console I/O or Code Snippet** This text ***Style*** denotes console input/output or a code snippet.
`# Console I/O comment` `// Code snippet comment`	**Console I/O or Code Snippet Comment** This text ***Style*** denotes a console input/output or code snippet comment. • Console I/O comment (preceded by "#") is for informational purposes only and does not denote actual console input/output. • Code Snippet comment (preceded by "//") may exist in the original code.

1 Differences Between SDK Versions

This section describes the differences between various SDK versions, details of their changes, and files to be modified.

1.1 UWBIOT_SR150_v03.15.11_MCUx

1.1.1 Details of Changes

<Common>

- Enable to print AoA for azimuth and elevation values on debug console
- Apply ToF and AoA calibration values for 2BP EVK

<For demo_ranging_controlee and demo_ranging_controller>

- Apply TX_POWER and XTAL calibration values for 2BP EVK
- Extend the time limit for ranging from 5 minutes to 30 minutes

> Changes are not prepared for demo_UWB_ble_sr1xxi.

1.1.2 Files to be Modified

- uwbiot-top/boards/Host/Rhodes4/UWB_DeviceConfig_SR1XX.h
- uwbiot-top/demos/SR1XX/demo_ranging_controlee/demo_ranging_controlee.c
- uwbiot-top/demos/SR1XX/demo_ranging_controller/demo_ranging_controller.c
- uwbiot-top/demos/common/Demo_Common_Config.c
- uwbiot-top/libs/uwb-iot/uwb_api/PrintUtility/PrintUtility.c

1.2 UWBIOT_SR150_v04.02.01_MCUx or Later

1.2.1 Details of Changes

<Common>

- Enable to print AoA for azimuth and elevation values on debug console
- Apply ToF and AoA calibration values for 2BP EVK

<For demo_ranging_controlee and demo_ranging_controller>

- Apply TX_POWER and XTAL calibration values for 2BP EVK
- Extend the time limit for ranging from 5 minutes to 30 minutes

<For demo_UWB_ble_sr1xxi / demo_nearby_interaction>

- Enable 3D AoA
- Apply TX_POWER and XTAL calibration values for 2BP EVK
- WORKAROUND: Modify SPI pin setting for 2BP EVK Rev4.0

> This workaround works only in v04.02.01 and is not required in later versions.

1.2.2 Files to be Modified

- uwbiot-top/boards/Host/Rhodes4/UWB_DeviceConfig_SR1XX.h
- uwbiot-top/boards/Rhodes4_SPI/pin_mux.c
- uwbiot-top/demos/SR1XX/demo_UWB_ble_sr1xxi/src/TLV_Mng.c (v04.02.01)
- uwbiot-top/demos/SR1XX/demo_nearby_interaction/src/TLV_Mng.c (v04.04.03 or later)
- uwbiot-top/demos/SR1XX/demo_ranging_controlee/demo_ranging_controlee.c
- uwbiot-top/demos/SR1XX/demo_ranging_controller/demo_ranging_controller.c
- uwbiot-top/demos/common/Demo_Common_Config.c
- uwbiot-top/libs/uwb-iot/uwb_api/PrintUtility/PrintUtility.c
- uwbiot-top/libs/uwb-iot/uwb_api/PrintUtility_Proprietary.c(v04.06.00)

2 How to Build the Pre-Built Binary

There are two steps for making pre-built binary.

- **Step 1:** Apply the “2bp_prebuilt_xx.xx.xx.patch” to Default SDK
- **Step 2:** Modify “UWBIOT_APP_BUILD.h” and Build the SDK

2.1 Step 1: Apply the “2bp_prebuilt_xx.xx.xx.patch” to Default SDK

There are two options to apply “2bp_prebuilt_xx.xx.xx.patch”.

> The following steps are described on v03.15.11. Please change the commands and patch name according to your SDK version.

2.1.1 Using Command User Interface

> In case of using MCUXpresso IDE for applying the patch, ignore this step.

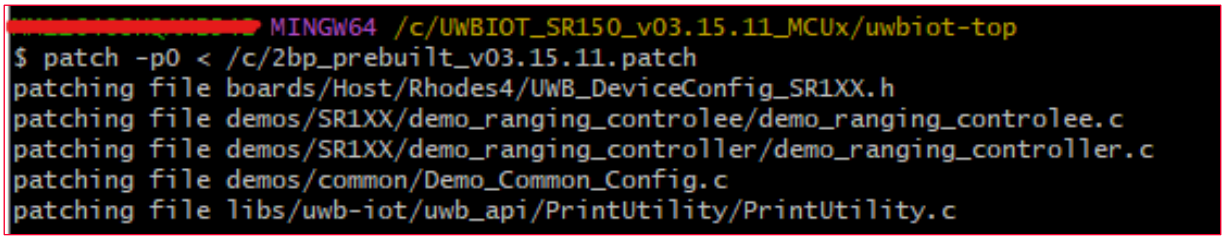
Run the commands below on your console. Ex) with Git Bash:

```
$ cd UWBIOT_SR150_v03.15.11_MCUx/uwbiot-top

$ patch -p0 < 2bp_prebuilt_v03.15.11.patch
```

Example of success log with Git Bash is shown in **Figure 1**.

Figure 1: Example of Success Log with Git Bash



2.1.2 Using MUCXpresso IDE

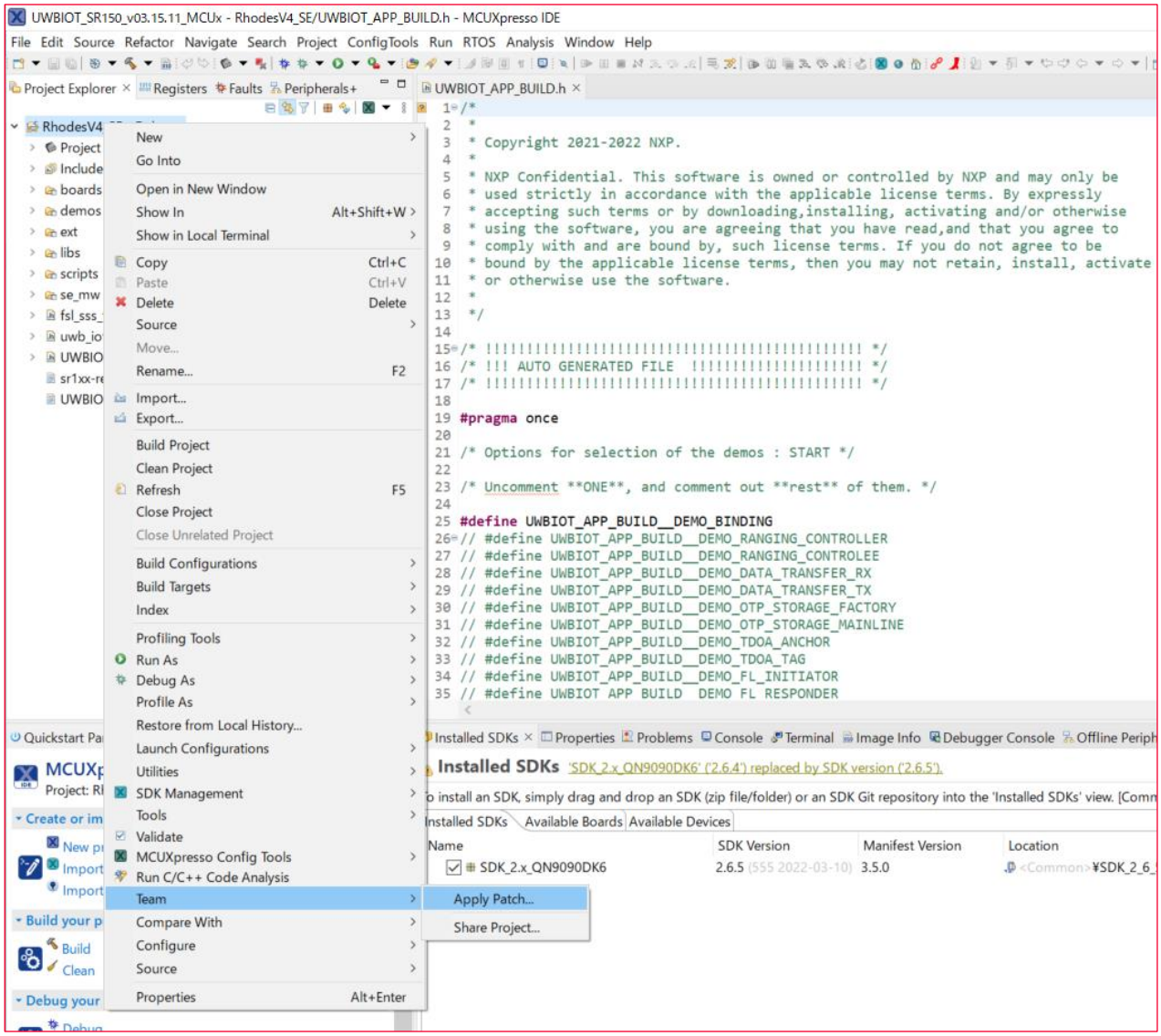
> In case of using command user interface for applying the patch, ignore this step.

1. Import “UWBIOT_SR150_v03.15.11_MCUx”

   > For details of how to import the project, please refer to “Starting Software Development Guide” on Type 2BP Document Site.

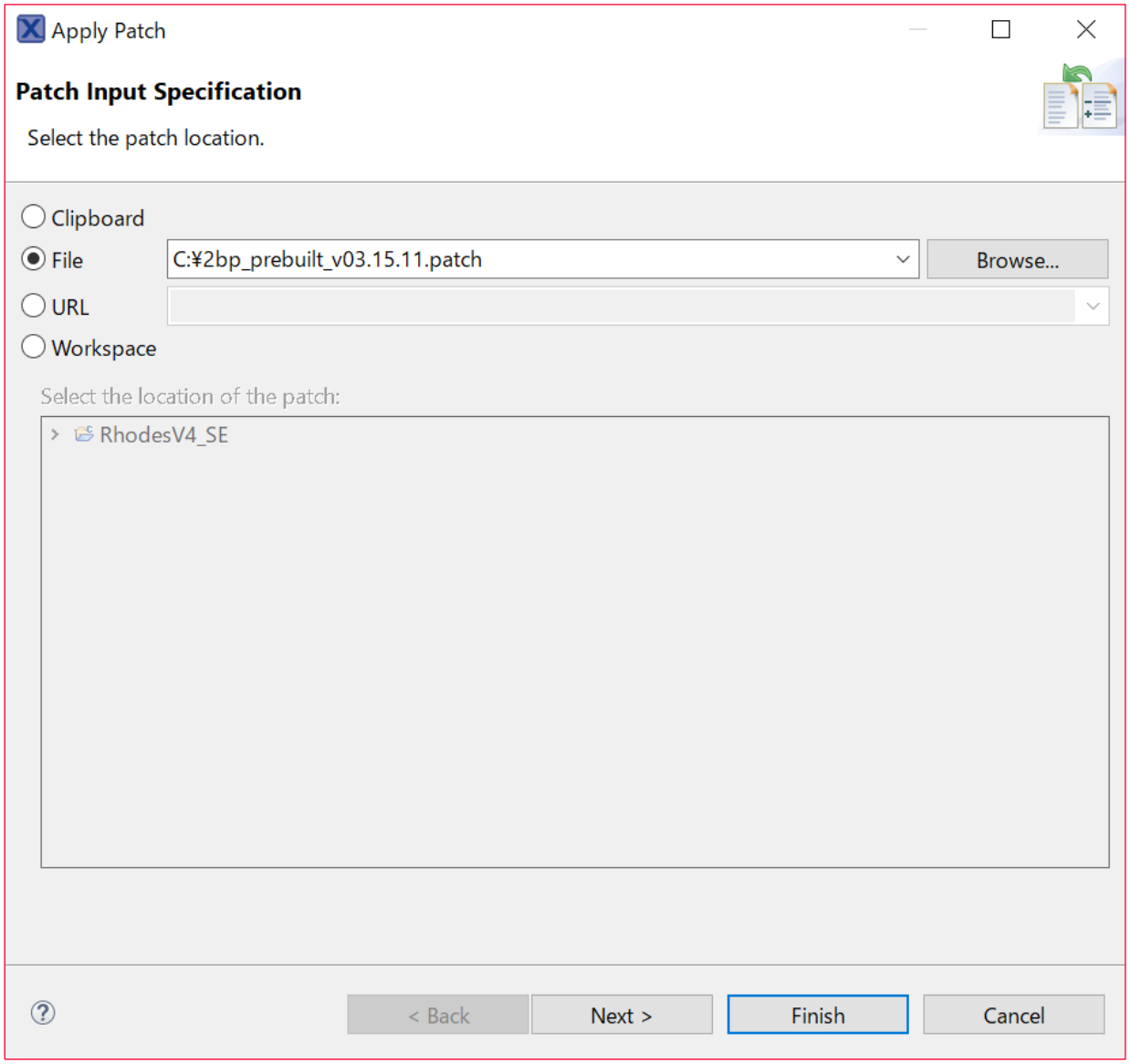
2. Right click on **RhodesV4_SE<Debug>**.
3. Point **Term**.
4. Click **Apply Patch…** (Figure 2).

Figure 2: Start to Apply Patch



5. Click **Browse…**
6. Select your path of **2bp_prebuilt_v03.15.11.patch**.
7. Click **Finish**.

Figure 3: Select the Patch to Apply



2.2 Step 2: Modify “UWBIOT_APP_BUILD.h” and Build the SDK

Modify the define to select your target demo application in “UWBIOT_APP_BUILD.h”, as shown in **Figure 4**.

For details of how to build the project, please refer to “Starting Software Development Guide” on Type 2BP Document Site.

Figure 4: Modify Define to Select Target Demo Application

*UWBIOT_APP_BUILD.h × demo_ranging_controlee.c

```
/* !!! AUTO GENERATED FILE  !!!!!!!!!!!!!!!!!!!! */
/* !!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!!! */

#pragma once

/* Options for selection of the demos : START */

/* Uncomment **ONE**, and comment out **rest** of them. */

// #define UWBIOT_APP_BUILD__DEMO_BINDING
// #define UWBIOT_APP_BUILD__DEMO_RANGING_CONTROLLER
#define UWBIOT_APP_BUILD__DEMO_RANGING_CONTROLEE
// #define UWBIOT_APP_BUILD__DEMO_DATA_TRANSFER_RX
// #define UWBIOT_APP_BUILD__DEMO_DATA_TRANSFER_TX
// #define UWBIOT_APP_BUILD__DEMO_OTP_STORAGE_FACTORY
// #define UWBIOT_APP_BUILD__DEMO_OTP_STORAGE_MAINLINE
```

2.3 Optional: Enable Pairing/Bonding for demo_UWB_ble_sr1xxi

Modify the definition in “boards/Host/Rhodes4/app_preinclude.h” as shown in **Figure 5** to enable pairing/bonding on Bluetooth LE. Change the values of gAppUseBonding_d and gAppUsePairing_d from 0 to 1. The passkey used for paring is “999999” as defined as gPasskeyValue_c.

This demo’s file name is changed to “demo_nearby_interaction” in v04.04.03 or later.
This modification is not included in the patch file.

Figure 5: Modify Define to Enable Pairing/Bonding

app_preinclude.h

```
/*! Enable/disable use of bonding capability */
#define gAppUseBonding_d 1

/*! Enable/disable use of pairing procedure */
#define gAppUsePairing_d 1

/*! Enable/disable use of privacy */
#define gAppUsePrivacy_d 0

#define gPasskeyValue_c 999999
```

Revision History

Revision	Date	Author	Change Description
3.0	Dec 15, 2022		Initial
4.0	Dec 26, 2022		Update for v04.02.01
4.0A	Apr 21, 2023		Added 2.3, enable pairing/bonding for demo_UWB_ble_sr1xxi
4.0B	Jun 01, 2023		Update for version 04.02.01 or later
4.0C	Mar 18, 2024		Document format changed