RNBD MCHPRT3 User Guide

RNBD

Introduction

This user guide provides detailed information about using the Microchip Radio Test 3 tool (MCHPRT3) with the Microchip RNBD. The MCHPRT3 enables the user to evaluate and demonstrate the RF performance of the RNBD.

Note: In this user guide, the MCHPRT3 tool with the RNBD Add-on Board is only shown as an example.

The MCHPRT3 is intended for development purposes. Any production test must use either a third-party production tool or users must develop their own production tool based on the DLL release.

Features

- COM PORT – COM Port Information and Configuration
- Baud Rate – 115200 (Default Value)
- RF Bluetooth® – Bluetooth Low Energy RF Parameter Configuration and Information

For more details, refer to Getting Started.

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1. Quick References

1.1. Hardware Prerequisites

- RNBD Add-on Board (RNBD programmed with HUT firmware)
- USB-A to Micro USB cable
- Bluetooth Low Energy tester (IQxel)

1.2. Software Prerequisites

Download the latest MCHPRT3 installer package from the Microchip website at www.microchip.com/MCHPRT.

- Windows® OS (version to be confirmed)
- MCHPRT3 installer package (`MCHPRT3_Setup_v1.0.x.XXXX.exe`)

1.3. Acronyms and Abbreviations

Table 1-1. Acronyms and Abbreviations

Acronyms and Abbreviations	Description
DUT	Device Under Test
GUI	Graphical User Interface
MCHPRT3 tool	Microchip Radio Test 3 tool

2. Overview

This section provides an overview of the MCHPRT3 tool setup and the components. Install the `MCHPRT3_setup_v1.0.1.XXXX.exe tool` available in the `C:\Microchip\` folder.

The following table provides the MCHPRT3 tool package files:

Table 2-1. MCHPRT3 Tool Package Files

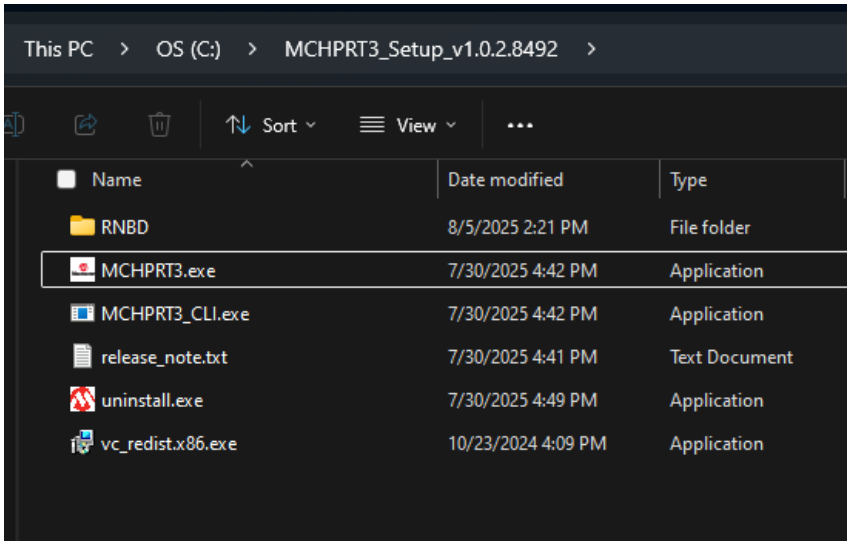
File Name	Description
`MCHPRT3.exe` file	MCHPRT3 executable file
`uninstall.exe` file	Uninstall the MCHPRT3 tool
`vc_redist.x86.exe` file	Microsoft® Visual C++ Redistributable (x86) executable file

The following table provides the RNBD package files:

Table 2-2. RNBD Package Files

File Name	Description
`RNBD.dll` file	RNBD dynamic link library file
`RNBD_GUI.dll` file	RNBD graphical user interface dynamic link library file
`Release_note.txt`	Tool release note file

Figure 2-1. MCHPRT3 Package Contents

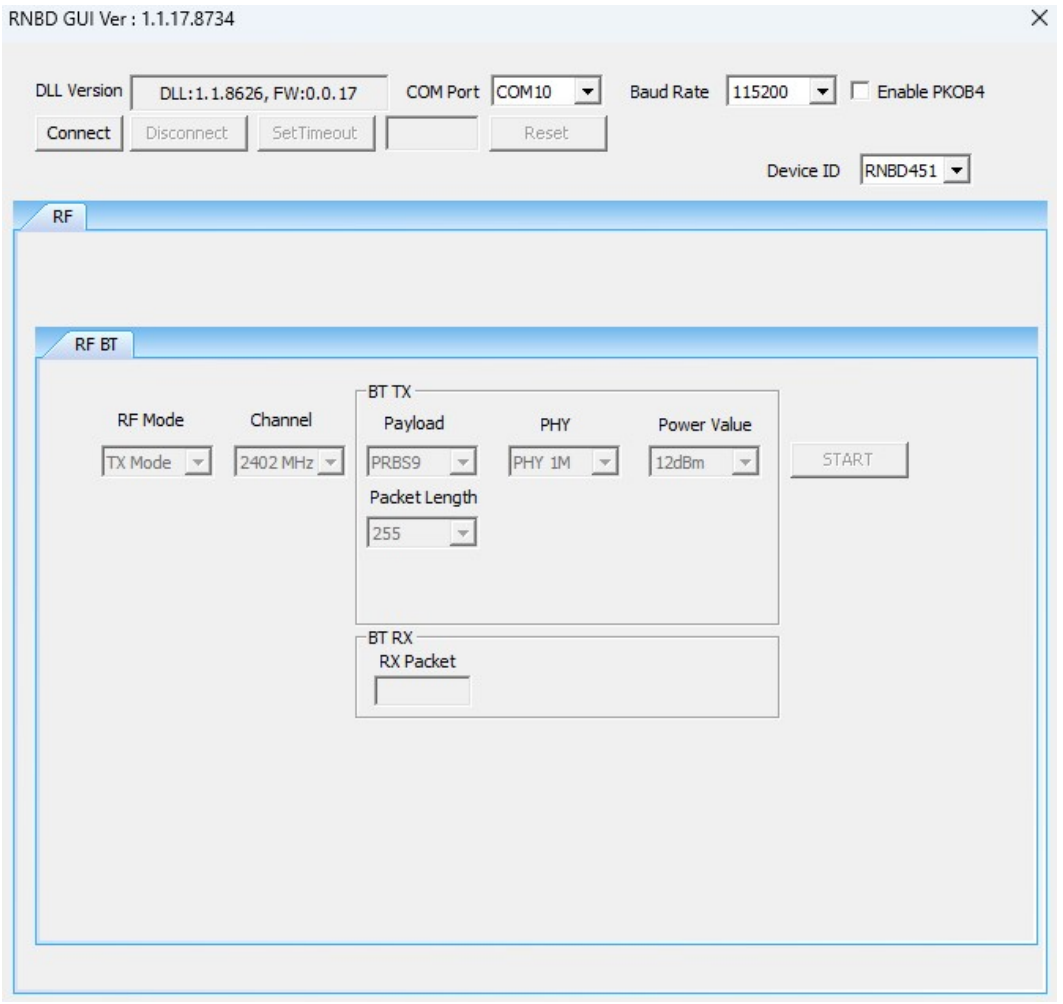


3. Getting Started

This section describes how to use the MCHPRT3 GUI to test or calibrate the RNBD with the Bluetooth Low Energy tester.

The following figure illustrates the MCHPRT3 for RNBD GUI with the following components:

Figure 3-1. RNBD GUI



3.1. Getting Started with MCHPRT3

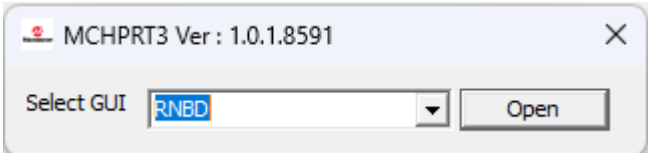
MCHPRT3 Package Features

- RF – RF test for Bluetooth TX/RX

The following are the steps to launch the MCHPRT3 tool:

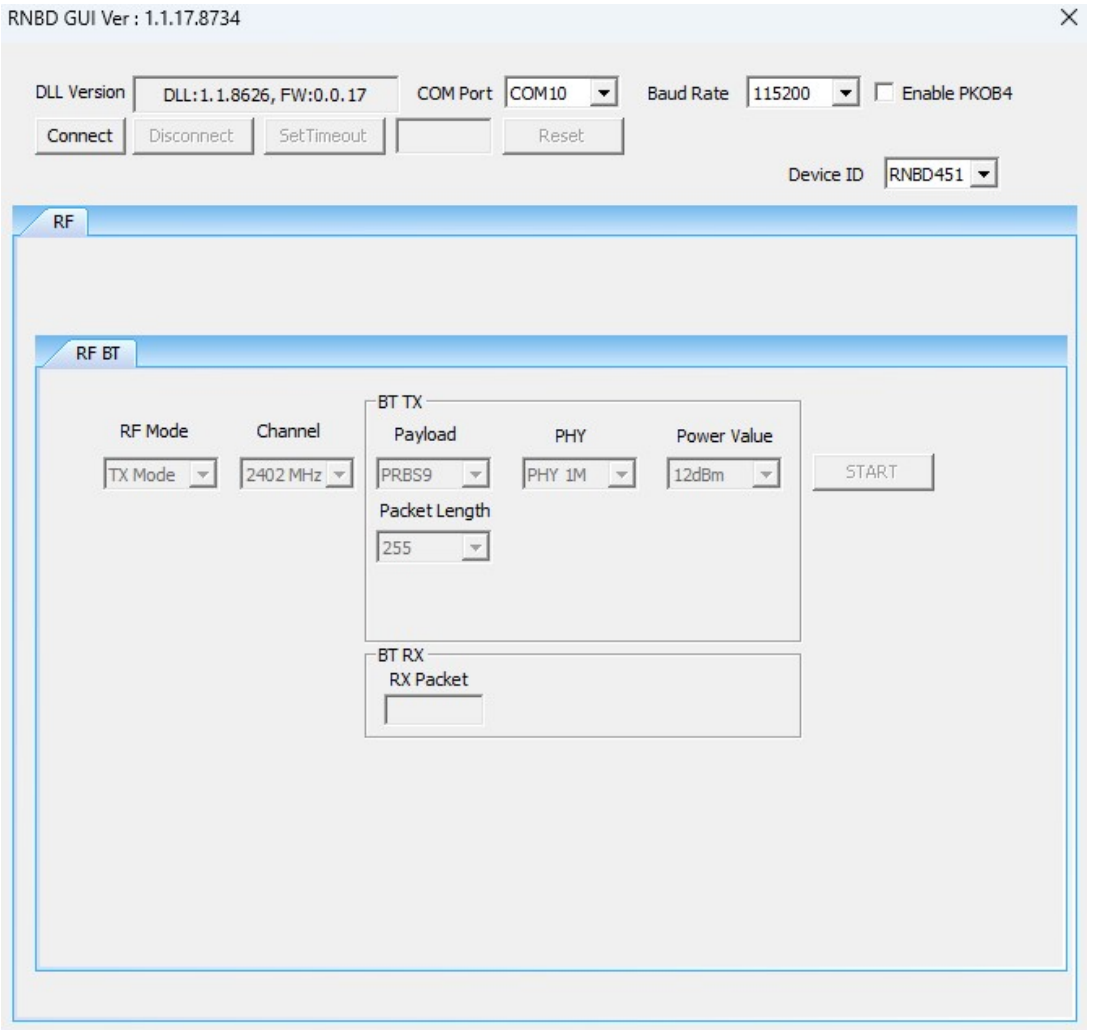
1. Double click `MCHPRT3.exe` under direction: `C:\Microchip\MCHPRT3_Setup_v1.0.1.XXXX`; the following screen appears.

Figure 3-2. Start-Up Window of the MCHPRT3 Tool



2. From the “Select GUI” drop-down list, select *RNBD*.
3. Click **Open** to launch the RNBD window (see the following figure).

Figure 3-3. RNBD GUI



Description of each component:

- Buttons on the top:
  - **Connect/Disconnect** – Connect or disconnect the RNBD
  - **Reset** – Reset the RNBD
  - **Enable PKOB4** – Only needed to check if the user is using the RNBD Add-on Board
- RF for Bluetooth – Settings of RF mode, channel and TX parameter for RF test
  - BT – TX setting of payload, PHY (data rate), packet length and power step (power level). RX – number of RX packet.

3.2. Getting Started with MCHPRT3 RNBD GUI

To run an RF test on the RNBD Family Add-on Board, perform the following procedure:

1. Connect the Type-C in the Curiosity Board to the PC.
2. Check whether the jumper for the current measurement was inserted or not.
3. Run `MCHPRT3.exe`.
4. From the “Select GUI” drop-down list, select *RNBD*.

5. Click **Open** to launch the RNBD window.
6. Select the respective “COM PORT” (check device manager in PC). A different USB-to-UART serial converter requires the corresponding driver; install accordingly.
7. Baud Rate - 115200 (default value).
8. Click **Connect**.
9. The device is ready for RF test.

3.3. MCHPRT3 RNBD GUI Demonstration

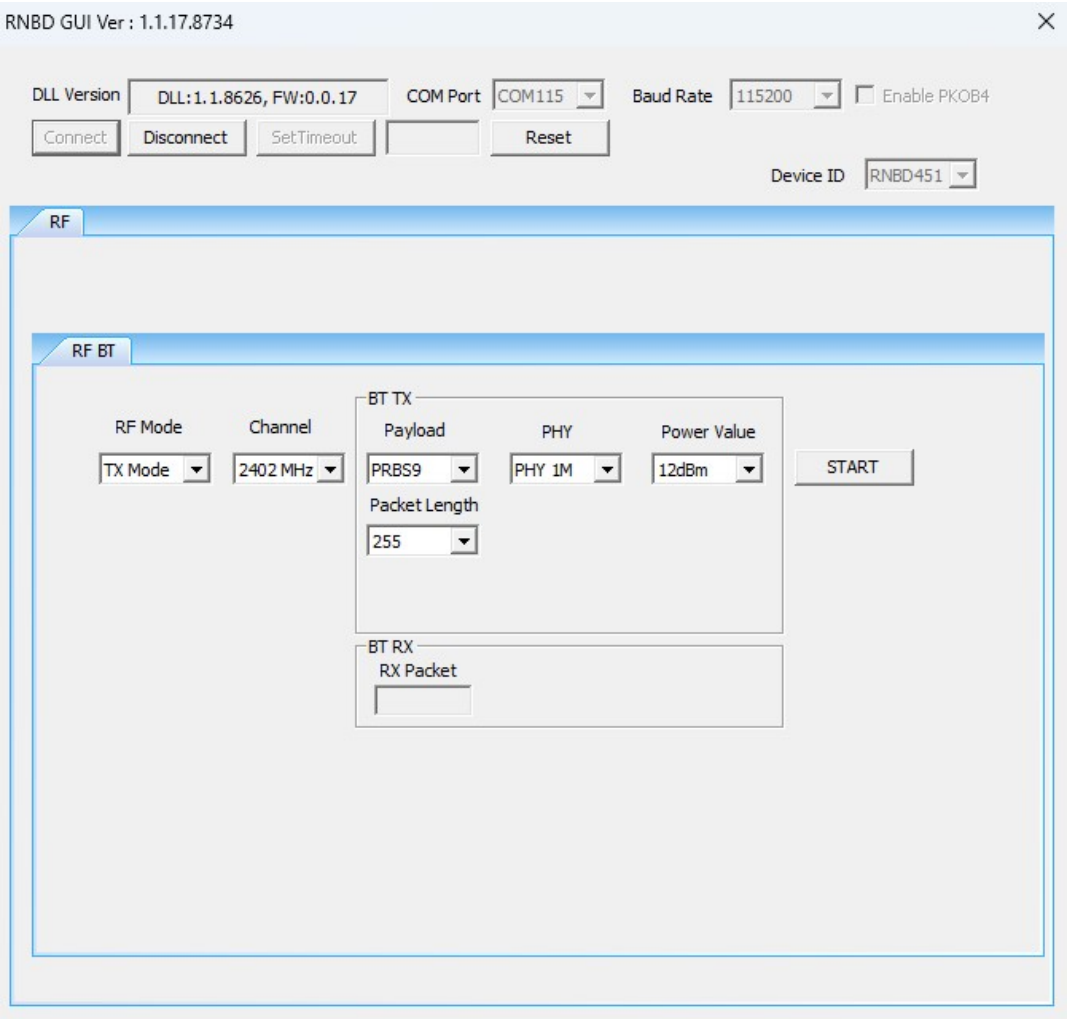
3.3.1. Bluetooth RF Test Demonstration

In this demonstration, the user can transmit Bluetooth Low Energy packets and enter RX mode and Test mode with the RNBD by using the MCHPRT3.

Perform the following steps for the demonstration of the Bluetooth RF TX modulation test:

1. Set up the connection between the RNBD Family Add-on Board and PC. For more details, refer to Getting Started with MCHPRT3.
2. In the **RF BT** tab, perform the following steps:
   a. From the “RF Modes” drop-down list, select *TX Mode*.
   b. From the “Channel” drop-down list, select *2402 MHz* for channel 37.
   c. From the “Payload” drop-down list, select *PRBS9* (default value).
   d. From the “PHY” drop-down list, select the *Data Rate* (1M, 2M, S = 2 and S = 8), for example, select *PHY 1M*.
   e. From the “Power” drop-down list, select the *Output Power*, for example, select *11 dB*.
   f. From the “Packet Length” drop-down list, select the *Packet Length (0–255)*, for example, *255* (default value).
3. Click **START** to transmit the Bluetooth Low Energy packet.

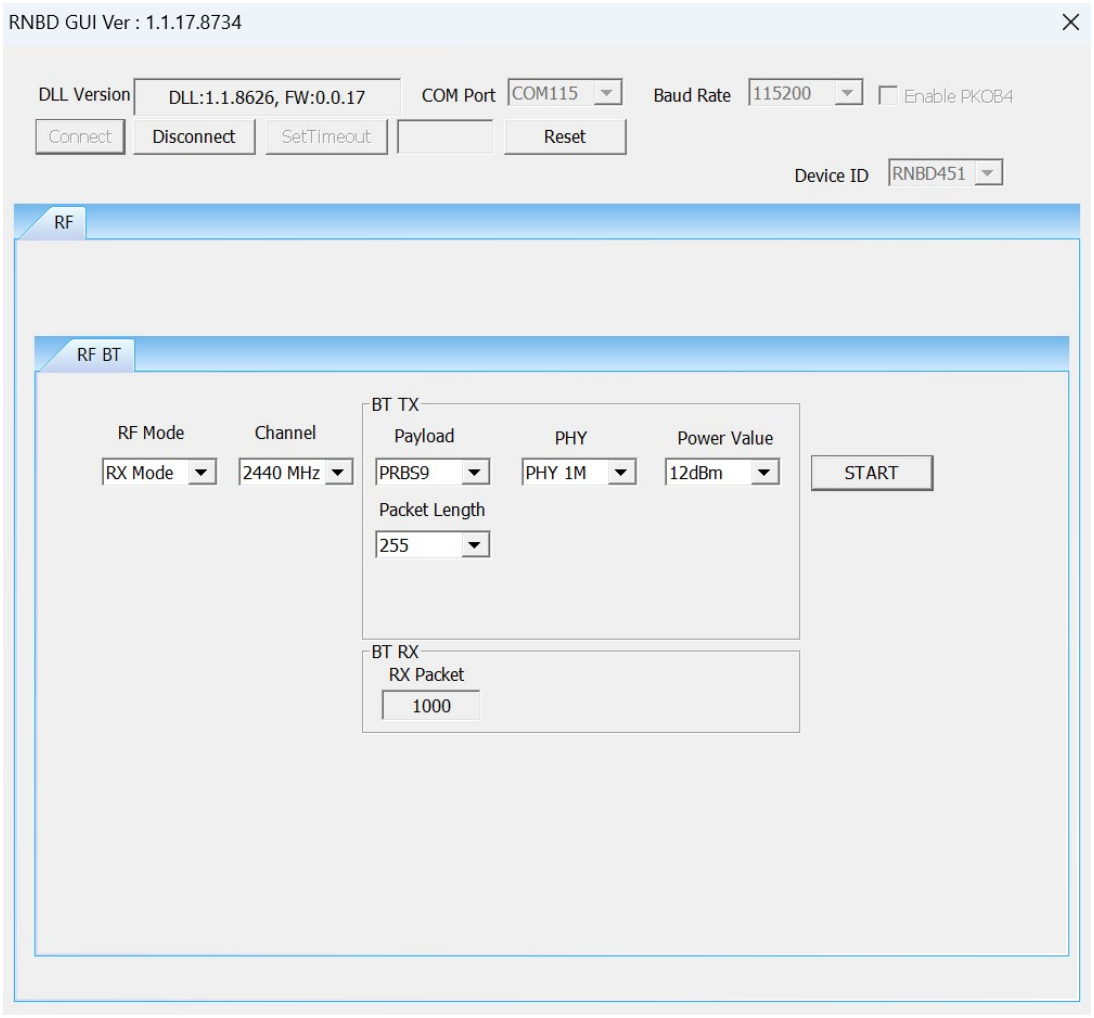
Figure 3-4. MCHPRT3 RNBD GUI for Bluetooth RF TX Modulation Test Demonstration



Perform the following steps for the demonstration of the Bluetooth RF RX mode:

1. Set up the connection between the RNBD Family Add-on Board and PC. For more details, refer to Getting Started with MCHPRT3.
2. In the **RF BT** tab, perform the following steps:
   a. From the “RF mode” drop-down list, select *RX Mode*.
   b. From the “Channel” drop-down list, select *2402 MHz* for channel 37.
3. Click **START** to receive the Bluetooth Low Energy packet. The number of received packets is shown in the drop-down list, “RX Packet”.

Figure 3-5. MCHPRT3 RNBD GUI for Bluetooth RF RX Mode Demonstration



4. Document Revision History

The revision history describes the changes that were implemented in the document. The changes are listed by revision, starting with the most current publication.

Revision	Date	Section	Description
A	03/2026	Document	Initial revision

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