RN487x Firmware 1.28.3 Release Note

March 1, 2018

1 Overview

Version 1.28.3 is a maintenance release for RN4870/71 modules. 1.28.3 addresses some issues that were identified in the previous 1.28.2. This firmware is made available on Microchip's web site for existing RN4870/RN4871 modules.

2 New Features

Firmware 1.28 adds new features to the previous 1.18.3 release. The following new features are listed below. Refer to the latest user guide, available at www.microchip.com/RN4870, and www.microchip.com/RN4871 for details about new commands:

- S_,xx command sets the beacon intervals defined by IB, NB commands. G_ returns the beacon interval. The beacon interval parameter xx is expressed in dd ms. This is a new feature for 1.28.2.
- I2C peripheral commands to control and exercise the I2C in Master modes.
- SPI peripheral commands to control and exercise the SPI peripheral in Master and Slave modes.
- Data Length Extension (DLE) feature support increases the BLE packet PDU length and provides higher throughput. The DLE feature can be optionally disabled using "SR,0010" command.
- LE Secure Connections feature support provides additional security during pairing against passive eavesdropping during pairing process.
- Added "GP" command to return the pin code set by the "SP" command.
- Added "SF,2" command to invoke a hard factory default which clears private services and any script.
- "CI" command used to start GATT client operation returns AOK.
- "SF,1" and "SF,2" serializes the Bluetooth name.
- The Command Mode Guard feature allows the device to stay in the data mode when the data stream contains default "$$$" command mode sequence, or the configured command mode character. The feature is enabled by issuing "SR,0008" command.

3 Known Issues

- When set passkey command SP,<6 digit pin> is used, the DisplayYesNo authentication mode SA,1 does not use the set 6 digit passkey.
- The total number of private characteristics that can be created using PS and PC commands are limited to 24 (3 services with 8 characteristics each) and not 32 characteristics (4 services with 8 characteristics each). Also any native

services and characteristics enabled by SS command count towards the total characteristics limit.

4 Resolved Issues

Issues resolved in 1.28.3

- To address a reported issue where configuration device settings were inadvertently modified, a backup and restore feature is provided in 1.28.3. device settings are copied at first bootup. During subsequent bootup the device settings are verified and restored if needed.
- Fixes an issue with the Connection Supervision Timeout when set to more than 6sec by the Central device connecting to the RN487x as a Peripheral device and a subsequent link loss resulting in configuration settings being inadvertently modified.
- Fixes an issue with "U,Z" clear pairing list command would not clear a full pairing table.
- Fixes issue with 9th device paired to device that would be inserted in second position instead of first position in paired device list.

Issues resolved in 1.28.2

- Firmware 1.28.2 fixes an issue where "Y" commands where required to pause advertising.

Issues resolved in 1.28.1

- Firmware 1.28.1 fixes "Unknown Device" boot up message when 1.28 is used in an industrial temperature version of BM70/71 modules.

Issues resolved in 1.28

- The PZ command to clear private services will reset the characteristic reference value basic to default. Any new characteristic reference defined using PC will enumerate starting from default value.
- PIO level command "|O,10,xx" for pin P1_3 will set the pin P1_3 logic high.
- The default state for PIO pin, P1_2 is configured correctly to ensure the deep sleep current.
- Fixed disconnect issue due to UART buffer overflow with RTS enabled.
- Fixed SA command pairing authentication modes issue. The updated value table for "SA,<0-4>" command is as below:

Value	Description
0	NoInputNoOutput with Bonding- RN4870/71 as responder automatically confirms passkey. The remote peer device as initiator manually or automatically confirms the pairing and bonds with the device.
1	DisplayYesNo – RN487x as responder will display and auto-confirm passkey. The remote peer device as initiator will display and manually confirm or auto-confirm passkey.
2	NoInputNoOutput – RN487x as responder will auto-confirm passkey. The remote peer device as initiator will manually confirm or auto-confirm passkey.

3	KeyboardOnly – RN487x as responder will input and manually confirm passkey. The remote peer device as initiator will display and manually confirm or auto-confirm passkey.
4	DisplayOnly – RN487x as responder will display and auto-confirm passkey. The remote peer device as initiator will input and manually confirm passkey.
5	KeyboardDisplay - RN4870/71 as responder displays and can manually or automatically confirm passkey. The remote peer device as initiator inputs and manually confirm passkey.

5 Recommendations

5.1 Stopping Advertisements

When starting advertisements using "A,<hex16>,<hex16>" with advertisement interval and total advertisement time parameters "Y" command needs to be issued only once to stop advertising.
For default advertising on power-on or when starting advertisements using "A" without parameters, issuing the "Y" command stops the fast advertisements. After the fast advertisement timeout of 30 seconds the slow advertisement starts and the "Y" command should be issued to stop the slow advertisements. This is resolved in 1.28.2.

5.2 Hardware Flow Control

When using Transparent UART for streaming data application, it is important to include the RTS/CTS hardware lines, and enable the hardware control feature. Without hardware flow control, it is possible for host to cause buffer overflow on RN4870 UART, which can result in instability.
When issuing frequent RN487x GATT access commands (SHW, SHR, SUW, SUR, CHW, CHR, CUW, CUR), higher command throughput is achieved by disabling flow control. The host MCU issuing the GATT commands must wait for a response, such as "AOK" before issuing the next command.

5.3 Connectable advertisements on Android devices

When using NA or IA commands to create custom connectable advertisements, the connectable FLAGS field must be included in order for Android devices to connect. This is done by preceding flags advertisement payload with the "NA,01,06" command. See the example below.

```
NA,Z
NA,01,06
NA,FF,CD00F014AD11CF40063F11E5BE3E0002A5D5C51B00BC00BD
```

5.4 Handle enumeration after clearing GATT services

If clearing or updating the GATT service and characteristic tables ensure that they remain same and not changed when using static characteristic handle values in a script or by a remote BLE Client. If the characteristic handle values change please ensure to update the script or remote BLE client with the new handle values.

6 Ordering Information

At the time of this publication 1.28.3 is released only as a firmware image on the www.microchip.com product pages for the RN4870/71. Contact your Microchip representative if 1.28.3 is required on RN4870/71 module.

7 Firmware Update Instructions for RN4870/BM70 PICtail & CDB

The instructions and tools used to update firmware on evaluation boards such as the RN4871 PICtail, and RN4870 PICtail SNSR board, are in appendix A of the user guide for of these boards. The links to the user guide is:

RN4870/71 PICtail/PICtail Plus Daughter Board User's Guide