

## Introduction

This release note is updated periodically to keep abreast of STM32CubeMonRF (hereinafter referred to as STM32CubeMonitor-RF) evolution, problems, and limitations.

Check the STMicroelectronics support website at [www.st.com](http://www.st.com) for the latest version. For the latest release summary, refer to [Table 1](#).

**Table 1. STM32CubeMonRF 2.8.0 release summary**

Type	Summary
Minor release	OTA speed improvement and new OTA option for STM32WB15xx

## Customer support

For more information or help concerning STM32CubeMonitor-RF, contact the nearest STMicroelectronics sales office or use the ST community at [community.st.com](http://community.st.com). For a complete list of STMicroelectronics offices and distributors, refer to the [www.st.com](http://www.st.com) web page.

## Software updates

Software updates and all the latest documentation can be downloaded from the STMicroelectronics support web page at [www.st.com/stm32cubemonrf](http://www.st.com/stm32cubemonrf).

# 1 General information

## 1.1 Overview

STM32CubeMonitor-RF is a tool provided to help designers to:

- Perform RF (Radio Frequency) tests of Bluetooth® Low Energy applications
- Perform RF (Radio Frequency) tests of 802.15.4 applications
- Send commands to Bluetooth Low Energy parts to perform tests
- Configure Bluetooth Low Energy beacon and manage file over-the-air (OTA) transfers
- Discover Bluetooth Low Energy devices profiles and interacts with services
- Send commands to OpenThread parts to perform tests
- Visualize Thread® devices connections
- Sniff 802.15.4 network

This software applies to microcontrollers of the STM32WB Series, based on Arm®<sup>(a)</sup> cores.



## 1.2 Host PC system requirements

### Supported operating systems and architectures

- Windows® 10, 32-bit (x86) or 64-bit (x64)
- Linux®<sup>(b)</sup> Ubuntu®<sup>(c)</sup>, minimum version 18.04 64-bit
- macOS®<sup>(d)</sup>, minimum version macOS Catalina®<sup>(d)</sup>, architecture Intel®<sup>(e)</sup> or M1

### Software requirements

For Linux, Java®<sup>(f)</sup> runtime environment (JRE) is required for the installer.

For 802.15.4 sniffer only:

- Wireshark v2.4.6 or later available from <https://www.wireshark.org>
- Python™ card v2.7.x or later available from <https://www.python.org/downloads>
- pySerial v3.4 or later, available from <https://pypi.org/project/pyserial>

---

a. Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.

b. Linux® is a registered trademark of Linus Torvalds.

c. Ubuntu® is a registered trademark of Canonical Ltd.

d. macOS® and macOS® Catalina are trademarks of Apple Inc. registered in the U.S. and other countries.

e. Intel is a trademark of Intel Corporation or its subsidiaries.

f. Oracle and Java are registered trademarks of Oracle and/or its affiliates.

## 1.3 Setup procedure

### 1.3.1 Windows

#### Install

If an older version of STM32CubeMonitor-RF is already installed, the existing version must be uninstalled before installing the new one. The user must have administrator rights on the computer to perform the installation.

1. Download *STM32CMonRFWin.zip*
2. Unzip this file in a temporary location
3. Launch *setupSTM32CubeMonitor-RF.exe* to be guided through the setup process

#### Uninstall

To uninstall STM32CubeMonitor-RF, follow the steps below:

1. Open the Windows Control panel
2. Select Programs and Features to display the list of programs installed on the computer
3. Left-click on STM32CubeMonitor-RF from STMicroelectronics publisher and select the Uninstall function

### 1.3.2 Linux

#### Software requirements

The Java run time environment is required for the Linux installer. It can be installed with the command *apt-get install default-jdk* or with the package manager.

#### Install

1. Download *STM32CMonRFLin.tar.gz*
2. Unzip this file in a temporary location
3. Make sure you have access rights to the target installation directory
4. Launch the execution of the *SetupSTM32CubeMonitor-RF.jar* file, or launch manually the installation with *java -jar <install path>/SetupSTM32CubeMonitor-RF.jar*
5. An icon appears on the desktop. If the icon is not executable, edit its properties and select the option "Allow executing file as program" or for Ubuntu® 19.10, select the option "Allow launching".

#### Information about com port on Ubuntu®

The modemmanager process is checking the com port when the board is plugged. Due to this activity, the com port is busy for a few seconds, and STM32CubeMonitor-RF is unable to connect.

The users need to wait for the end of the modemmanager activity before opening the com port. If the modemmanager is not required by the user, it is possible to uninstall it with the command *sudo apt-get purge modemmanager*.

For the sniffer mode, the modem manager must be uninstalled or disabled through the command *sudo systemctl stop ModemManger.service* before connecting the sniffer device.

If the modem manager cannot be disabled, it is also possible to define rules so that the modem manager ignores the sniffer device. *10-stsniffer.rules* available in the

~/STMicroelectronics/STM32CubeMonitor-RF/sniffer directory can be copied in */etc/udev/rules.d*.

### Uninstall

1. Launch the “*uninstaller.jar*” located in installation directory */STMicroelectronics/STM32CubeMonitor-RF/Uninstaller*. If the icon is not executable, edit its properties and select the option “Allow executing file as program”.
2. Select “Force deletion...” and click on the Uninstall button.

## 1.3.3 macOS®

### Install

1. Download “*STM32CMonRFMac.zip*”.
2. Unzip this file in a temporary location.
3. Make sure you have access rights to the target installation directory.
4. Double click on the *installerSTM32CubeMonitor-RF.dmg* file.
5. Open the STM32CubeMonitor-RF new disk.
6. Drag and drop the STM32CubeMonitor-RF shortcut to the Applications shortcut.
7. Drag and drop the document folder to a location of your choice.

If an error “STM32CubeMonitor-RF can't be opened because it is from an unidentified developer” occurs, the command *sudo spctl --master-disable* must be used to disable the verification.

### Uninstall

1. In the applications folder, select the STM32CubeMonitor-RF icon and move it to trash.
2. In the user's home directory, remove the folder Library/STM32CubeMonitor-RF.  
If the Library folder is hidden:
  - a) open Finder
  - b) hold down Alt (Option) and choose Go from the drop-down menu bar at the top of the screen
  - c) the Library folder is listed below the Home folder.

## 1.4 Devices supported by STM32CubeMonitor-RF

### Supported devices

The tool is tested with the STM32WB55 Nucleo and dongle boards (P-NUCLEO-WB55) and with the STM32WB15 Nucleo board (NUCLEO-WB15CC).

Boards based on STM32WBxx are compatible if they feature:

- A connection through a USB “Virtual COM port” or a serial link and
- A test firmware:
  - *Transparent mode* for Bluetooth Low Energy
  - *Thread\_Cli\_Cmd* for Thread
  - *Phy\_802\_15\_4\_Cli* for 802.15.4 RF test
  - *Mac\_802\_15\_4\_Sniffer.bin* for sniffer

The device connection details and firmware location are described in Section 2 of the user manual *STM32CubeMonitor-RF software tool for wireless performance measurements* (UM2288).

## 2 Release information

### 2.1 New features/enhancements

OTA improvement:

- Add an option in the OTA panel to increase the packet length (MTU) to optimize speed.
- Add a menu to select the target. It is required to compute the number of sectors to erase for SMT32WB15xx.
- Remove the modulations not suitable for PER test in the PER picklist.

### 2.2 Fixed issues

This release:

- Fixes the bug 102779: Displaying offset and attribute data length is reversed for ACI\_GATT\_ATTRIBUTE\_MODIFIED\_EVENT.
- Aligns the message HCI\_ATT\_EXCHANGE\_MTU\_RESP\_EVENT with AN5270.
- Fixes the attribute name in HCI\_LE\_DATA\_LENGTH\_CHANGE\_EVENT.
- Improves the welcome screen layout for small screens.

### 2.3 Restrictions

When the device under test is disconnected the software may not immediately detect the disconnection. In this case, an error is reported when a new command is sent. If the board is not detected after the error, it is necessary to unplug and then reconnect it.

For the 802.15.4 sniffer, the firmware *Mac\_802\_15\_4\_Sniffer.bin* delivered with the tool must be used only with *stm32wb5x\_Mac\_802\_15\_4\_fw.bin version 1.11* (co-processor wireless binary code in STM32Cube firmware version 1.11). The firmware version 1.12 is not compatible with the sniffer firmware.

For sniffer on macOS, the sniffer python file must be set with executable right after copy. The command is: `chmod+x stm32cubeMonRf_sniffer.py`.

On some Ubuntu® 18 systems, there may be a conflict in java FX with the GTK version. If the error *Gdk-CRITICAL \*\*: 12:47:45.162: gdk\_x11\_display\_set\_window\_scale* is displayed, the tool must be launched from the command line with a specific option: In the tool binary folder, use the command: `jre/bin/java -Djdk.gtk.version=2 -jar STM32CubeMonitor-RF.jar`.

## 2.4 Licensing

STM32CubeMonRF is delivered under the Mix Ultimate Liberty+OSS+3rd-party V1 software license agreement (SLA0048).

[Table 2](#) provides a detailed description of the licenses of additional components in STM32CubeMonRF.

**Table 2. List of licenses embedded in the tool**

Name	Version	License	Details	Copyright
ST components	-	Proprietary	<a href="https://www.st.com/sla0048">https://www.st.com/sla0048</a>	STMicroelectronics
jSerialComm	2.5.1	Apache-2.0 <sup>(1)</sup>	<a href="http://fazecast.github.io/jSerialComm/">http://fazecast.github.io/jSerialComm/</a>	Copyright © 2012-2020 Fazecast, Inc.
commons-lang3	3.5		<a href="http://commons.apache.org/proper/commons-lang/">http://commons.apache.org/proper/commons-lang/</a>	Copyright © The Apache Software Foundation
Apache Commons IO	2.5		<a href="http://commons.apache.org/proper/commons-io/">http://commons.apache.org/proper/commons-io/</a>	
log4j-api	2.8.1		<a href="https://logging.apache.org/log4j/2.x/">https://logging.apache.org/log4j/2.x/</a>	
log4j-core				
izpack	5.1.3		<a href="http://izpack.org/">http://izpack.org/</a>	Julien Ponge, René Krell and the IzPack contributors
gson	2.2.4		<a href="https://github.com/google/gson">https://github.com/google/gson</a>	Copyright © 2008 Google Inc.
Roboto font	2.137		<a href="https://github.com/google/fonts/">https://github.com/google/fonts/</a>	Google Inc.
Cousine font	1.211		<a href="https://github.com/google/fonts/tree/master/apache/cousine">https://github.com/google/fonts/tree/master/apache/cousine</a>	
font awesome svg icons	5.2.0		CC BY-4.0 <sup>(2)</sup>	<a href="https://github.com/FortAwesome/Font-Awesome/">https://github.com/FortAwesome/Font-Awesome/</a>
launch4j	3.12	BSD-3-Clause	<a href="https://sourceforge.net/projects/launch4j/">https://sourceforge.net/projects/launch4j/</a>	Copyright © 2004, 2017 Grzegorz Kowal

1. Refer to <https://opensource.org/licenses/alphabetical>.

2. Refer to <https://creativecommons.org/licenses/by/4.0/legalcode>.

**Table 3. List of software bundled with the tool**

Name	Version	License	Details	Copyright
Java SE and Java FX	1.8.0-265	GPL-2.0 with Classpath Exception	Copy of license is in the License folder <a href="https://openjdk.java.net/legal/gplv2+ce.html">https://openjdk.java.net/legal/gplv2+ce.html</a>	Copyright © 1995, 2020, Oracle and/or its affiliates.
Inno setup	6.0.5	Inno Setup license	Windows installer: <a href="http://www.innosetup.com/">http://www.innosetup.com/</a>	Copyright © 1997-2020 Jordan Russell. All rights reserved. Portions Copyright © 2000-2020 Martijn Laan. All rights reserved.

## 3 STM32CubeMonitor-RF release information

### 3.1 STM32CubeMonitor-RF V1.5.0

- Tool first version to support Bluetooth Low Energy features of STM32WB55xx. Versions 1.x.y have only Bluetooth Low Energy support.

### 3.2 STM32CubeMonitor-RF V2.1.0

- Addition of OpenThread support in the tool

### 3.3 STM32CubeMonitor-RF V2.2.0

- Improvement of OpenThread command windows: Option to clear windows/history, details about OT commands selected in the tree
- Addition of “read param” and “set param” buttons for OT commands used to read or set parameters
- Addition of scripts for OpenThread
- It is possible to add a loop in the script (Refer to the user manual for details)
- User interface update: the disabled items are now colored in gray
- Search command for threads has been implemented
- Addition of the selection of Bluetooth Low Energy PHY and modulation index
- In Bluetooth Low Energy RF tests, the frequency can be changed when the test is running

### 3.4 STM32CubeMonitor-RF V2.2.1

#### 3.4.1 New features/enhancements

The OTA download procedure has been updated: When the target device is configured in OTA loader mode, the target address is incremented by one. STM32CubeMonitor-RF now uses the incremented address for the download.

The list of OpenThread commands is aligned with the Thread stack.

### 3.5 STM32CubeMonitor-RF V2.3.0

#### 3.5.1 New features/enhancements

Alignment with STM32WB55 cube firmware 1.0.0

Addition of 802.15.4 RF tests

New features in *ACI Utilities* panel:

-The discovery of remote Bluetooth Low Energy devices



-Interaction with the services of remote devices

## **3.6 STM32CubeMonitor-RF V2.4.0**

### **3.6.1 New features/enhancements**

Alignment with STM32WB cube firmware 1.1.1

Support firmware update over the air of the wireless stack (FUOTA)

Optimize FUOTA connection parameters to increase performance. Add a warning if the address is below 0x6000.

Correction of UART detection issue on windows 10

The tool uses properly the “write without response” function to write a characteristic with permission “write without response”

Update the device name in the device information box

Fix the value of HCI\_LE\_SET\_EVENT\_MASK

Correction of error reason description text

Fix issues with OpenThread scripts

Set a maximum size for graphs

Update some control lock to prevent wrong actions from the user

## **3.7 STM32CubeMonitor-RF V2.5.0**

### **3.7.1 New features/enhancements**

Network Explorer is added to a new tab of Thread® mode.

This feature displays the connected Thread® devices and the connections between them.

## **3.8 STM32CubeMonitor-RF V2.6.0**

### **3.8.1 New features/enhancements**

802.15.4 RF tests are added.

In the transmitter test, the sending of MAC frames is available, the frame is defined by the user.

In the receiver test, the LQI, ED, and CCA tests are available and the PER test shows the decoded frames.

### 3.8.2 Fixed issues

This release:

- Updates the C1\_Read\_Device\_Information command description,
- Disables the navigation link when the 802.15.4 receiver test is in progress,
- Updates ST logo and colors,
- Fixes the blank popup message displayed when the script detects an error,
- Disables the start button as soon as the channel list is inconsistent in 802.15.4 PER multi-channel test,
- Includes workaround to prevent freeze observed on a serial port with MacOS.

## 3.9 STM32CubeMonitor-RF V2.7.0

### 3.9.1 New features/enhancements

Updates OpenThread API with version 1.1.0.

Adds the OpenThread CoAP Secure API.

Adds 802.15.4 sniffer mode.

### 3.9.2 Fixed issues

This release:

- Fixes the OTA updater panel address bytes inverted,
- Fixes the OpenThread network explore button label management,
- Fixes the behavior of parameter field when the parameter is from the terminal and is wrong,
- Fixes the naming of Bluetooth Low Energy commands according to AN5270 specification,
- Fixes OpenThread com port connection fail behavior,
- Fixes Bluetooth Low Energy tester connection fail behavior on Linux,
- Fixes OpenThread panId hexadecimal value display,
- Improve SBSFU OTA and tests,
- Fixes ACI client characteristic configuration after reconnection.

## 3.10 STM32CubeMonitor-RF V2.7.1

### 3.10.1 New features/enhancements

802.15.4 sniffer fixes.

### 3.10.2 Fixed issues

This release:

- Fixes error on quick Wireshark sniffer stop then start,
- Removes two extra bytes in sniffed data.

## 4 Revision history

**Table 4. Document revision history**

Date	Revision	Changes
02-Mar-2017	1	Initial release.
25-Apr-2017	2	Modified for release 1.2.0: <ul style="list-style-type: none"> <li>– updated <a href="#">Section 2: Release information</a></li> <li>– updated <a href="#">Section 2.3: Restrictions</a></li> <li>– added <a href="#">Section 3.2: STM32CubeMonitor-RF V1.2.0 information</a></li> </ul>
27-Jun-2017	3	Changed document classification to ST Restricted. Modified for release 1.3.0, hence updated document title and added <a href="#">Section 3.3: STM32CubeMonitor-RF V1.3.0 information</a> . Updated <a href="#">Section 1.2: Host PC system requirements</a> , <a href="#">Section 1.3: Setup procedure, Device configuration</a> , <a href="#">Section 2.1: New features/enhancements</a> , <a href="#">Section 2.2: Fixed issues</a> , <a href="#">Section 2.3: Restrictions</a> and <a href="#">Section 3.2: STM32CubeMonitor-RF V1.2.0 information</a> .
29-Sep-2017	4	Modified for release 1.4.0, hence updated document title and added <a href="#">Section 3.4: STM32CubeMonitor-RF V1.4.0 information</a> . Updated <a href="#">Section 1.1: Overview</a> , <a href="#">Section 1.2: Host PC system requirements</a> , <a href="#">Section 1.3.1: Windows</a> , <a href="#">Section 1.4: Devices supported by STM32CubeMonitor-RF</a> , <a href="#">Section 2.1: New features/enhancements</a> , <a href="#">Section 2.2: Fixed issues</a> and <a href="#">Section 2.3: Restrictions</a> . Added <a href="#">Section 1.3.2: Linux</a> , <a href="#">Section 1.3.3: macOS</a> , and <a href="#">Section 2.4: Licensing</a> . Updated <a href="#">Table 1: STM32CubeMonitor-RF 1.4.0 release summary</a> .
29-Jan-2018	5	Modified for release 1.5.0, hence updated document title and added <a href="#">Section 3.5: STM32CubeMonitor-RF V1.5.0 information</a> . Updated <a href="#">Section 1.2: Host PC system requirements</a> , <a href="#">Section 1.3.2: Linux, Device configuration</a> , <a href="#">Section 2.1: New features/enhancements</a> , <a href="#">Section 2.2: Fixed issues</a> and <a href="#">Section 2.3: Restrictions</a> . Updated <a href="#">Table 1: STM32CubeMonitor-RF 1.5.0 release summary</a> and <a href="#">Table 2: List of licenses</a> .
14-May-2018	6	Modified for release 2.1.0, hence updated document title and added <a href="#">Section 3.6: STM32CubeMonitor-RF V2.1.0 information</a> . Updated <a href="#">Section 1.1: Overview</a> , <a href="#">Section 1.2: Host PC system requirements</a> , <a href="#">Section 2.1: New features/enhancements</a> , <a href="#">Section 2.2: Fixed issues</a> , <a href="#">Section 2.3: Restrictions</a> . Updated <a href="#">Table 1: STM32CubeMonitor-RF 2.1.0 release summary</a> and <a href="#">Table 2: List of licenses</a> .
24-Aug-2018	7	Modified for release 2.2.0, hence updated document title and added <a href="#">Section 3.7: STM32CubeMonitor-RF V2.2.0 information</a> . Updated <a href="#">Section 2.1: New features/enhancements</a> , <a href="#">Section 2.2: Fixed issues</a> , <a href="#">Section 2.2: Restrictions</a> . Updated <a href="#">Table 1: STM32CubeMonitor-RF 2.3.0 release summary</a> and <a href="#">Table 2: List of licenses</a> .

Table 4. Document revision history (continued)

Date	Revision	Changes
15-Oct-2018	8	Modified for release 2.2.1, hence updated document title and added <a href="#">Section 3.8: STM32CubeMonitor-RF V2.2.1 information</a> . Updated <a href="#">Section 1.1: Overview</a> , <a href="#">Section 1.3.2: Linux®</a> , <a href="#">Section 1.3.3: macOS®</a> , <a href="#">Section 2.1: New features/enhancements</a> , and <a href="#">Section 2.2: Restrictions</a> . Removed former <a href="#">Section 2.2: Fixed issues</a> .
15-Feb-2019	9	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.3.0 release – <a href="#">Section 3</a> former releases history – <a href="#">Section 1.1: Overview</a> to add OpenThread and 802.15.4 RF – <a href="#">Section 1.3: Setup procedure</a> with different OS
12-Jul-2019	10	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.4.0 release – <a href="#">Table 2</a> jSerialComm version – <a href="#">Section 3</a> former releases history
3-Apr-2020	11	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.5.0 release – <a href="#">Table 2</a> Inno setup version – <a href="#">Section 3</a> former releases history
13-Nov-2020	12	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.6.0 release – <a href="#">Table 2</a> and <a href="#">Table 3</a> details with added copyright column – <a href="#">Section 3</a> former releases history
8-Feb-2021	13	Updated: – Title, <a href="#">Table 1</a> , <a href="#">Section 1</a> , and <a href="#">Section 2</a> switch to 2.7.0 release with new 802.15.4 sniffer mode and <a href="#">Host PC system requirements</a> – <a href="#">Table 3</a> Java SE and Java FX version – <a href="#">Section 3</a> former releases history
8-Jun-2021	14	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.7.1 release with 802.15.4 sniffer fixes – <a href="#">Section 3</a> former releases history
15-Jul-2021	15	Updated: – Title, <a href="#">Table 1</a> , and <a href="#">Section 2</a> switch to 2.8.0 release with OTA speed improvement and new OTA option for STM32WB15xx – <a href="#">Section 1.4</a> support for NUCLEO-WB15CC and test firmware explanation – <a href="#">Table 2</a> with SLA0048 in <a href="#">Licensing</a> – <a href="#">Table 3</a> with Inno setup version – <a href="#">Section 3</a> former releases history

**IMPORTANT NOTICE – PLEASE READ CAREFULLY**

STMicroelectronics NV and its subsidiaries (“ST”) reserve the right to make changes, corrections, enhancements, modifications, and improvements to ST products and/or to this document at any time without notice. Purchasers should obtain the latest relevant information on ST products before placing orders. ST products are sold pursuant to ST’s terms and conditions of sale in place at the time of order acknowledgement.

Purchasers are solely responsible for the choice, selection, and use of ST products and ST assumes no liability for application assistance or the design of Purchasers’ products.

No license, express or implied, to any intellectual property right is granted by ST herein.

Resale of ST products with provisions different from the information set forth herein shall void any warranty granted by ST for such product.

ST and the ST logo are trademarks of ST. For additional information about ST trademarks, please refer to [www.st.com/trademarks](http://www.st.com/trademarks). All other product or service names are the property of their respective owners.

Information in this document supersedes and replaces information previously supplied in any prior versions of this document.

© 2021 STMicroelectronics – All rights reserved