

nRF Connect Programmer

v3.0.3

User Guide

Contents

	Revision history.	iii
1	Introduction.	4
2	Installing the Programmer app.	5
3	Overview and user interface.	6
4	Programming a Development Kit or the nRF51 Dongle.	9
5	Programming the nRF52840 Dongle.	10
6	Troubleshooting.	11
	Legal notices.	12

Revision history

Date	Description
2022-09-06	Updated images and text for new user interface in nRF Connect Programmer v3.0.3
2022-02-21	Removed nRF9160 DK related content. Removed content is found in Getting started with nRF9160 DK
2021-10-26	Added SW10 information to the following: <ul style="list-style-type: none">• Programming the nRF9160 DK• Programming applications on nRF9160 DK• Programming the nRF9160 DK cellular modem
2021-08-12	<ul style="list-style-type: none">• Updated Programming applications on nRF9160 DK• Removed Nordic Thingy:91™ related content. Removed content is found in Getting started with Thingy:91.• Editorial changes
August 2020	Updated: <ul style="list-style-type: none">• Introduction on page 4• Overview and user interface on page 6• Programming a Development Kit or the nRF51 Dongle on page 9• Programming the nRF52840 Dongle on page 10• Programming the nRF9160 DK• Programming Nordic Thingy:91• Troubleshooting on page 11
May 2020	Added Figure 5: Nordic Thingy:91 buttons on page 16
April 2020	<ul style="list-style-type: none">• Updated Supported devices in Introduction on page 4• Updated Overview and user interface on page 6• Added Programming the nRF9160 DK• Added Programming Nordic Thingy:91 on page 15
September 2019	Updated to match nRF Connect Programmer v1.2.3: <ul style="list-style-type: none">• Added Programming the nRF9160 DK cellular modem• Updated Overview and user interface on page 6• Updated Installing the Programmer app on page 5
May 2019	Updated Installing the Programmer app on page 5
February 2019	First release

Previous versions

PDF files for relevant previous versions are available here:

- [nRF Connect Programmer User Guide v1.4.1](#) (corresponds to nRF Connect Programmer v1.4.1)
- [nRF Connect Programmer User Guide v1.3](#) (corresponds to nRF Connect Programmer v1.3)

1 Introduction

nRF Connect Programmer is an app available from [nRF Connect for Desktop](#) that you can use to program firmware to Nordic devices. The application allows you to see the memory layout for both J-Link and Nordic USB devices. It also allows you to display content of HEX files and write it to the devices.

Supported devices

- Nordic Thingy:91
- Nordic Thingy:52
- nRF91 Series DKs
- nRF53 Series DKs
- nRF52 Series DKs and Dongle
- nRF51 Series DKs and Dongle

2 Installing the Programmer app

Programmer is installed as an app for nRF Connect for Desktop.

Before you can install the app, you must download and install [nRF Connect for Desktop](#) (version 3.2.0 or later).

To install the Programmer app:

1. Open nRF Connect for Desktop.
2. Find Programmer in the list of apps and click **Install**.

Once the app is installed, you can launch it by clicking **Open**.

For easy access, you can create a desktop shortcut by clicking the **arrow down** button and selecting **Create shortcut**.

If a new version of the app becomes available, an **Update** button is displayed next to the **Open** button. Click this button to install the latest version.

To uninstall the app, click the **arrow down** button and select **Uninstall**.

3 Overview and user interface

The nRF Connect Programmer app main window shows the memory layout of device and file you want to work with. It also provides you with options to program the device and inspect the whole process through the log.

When you start the Programmer app, the following main window appears:

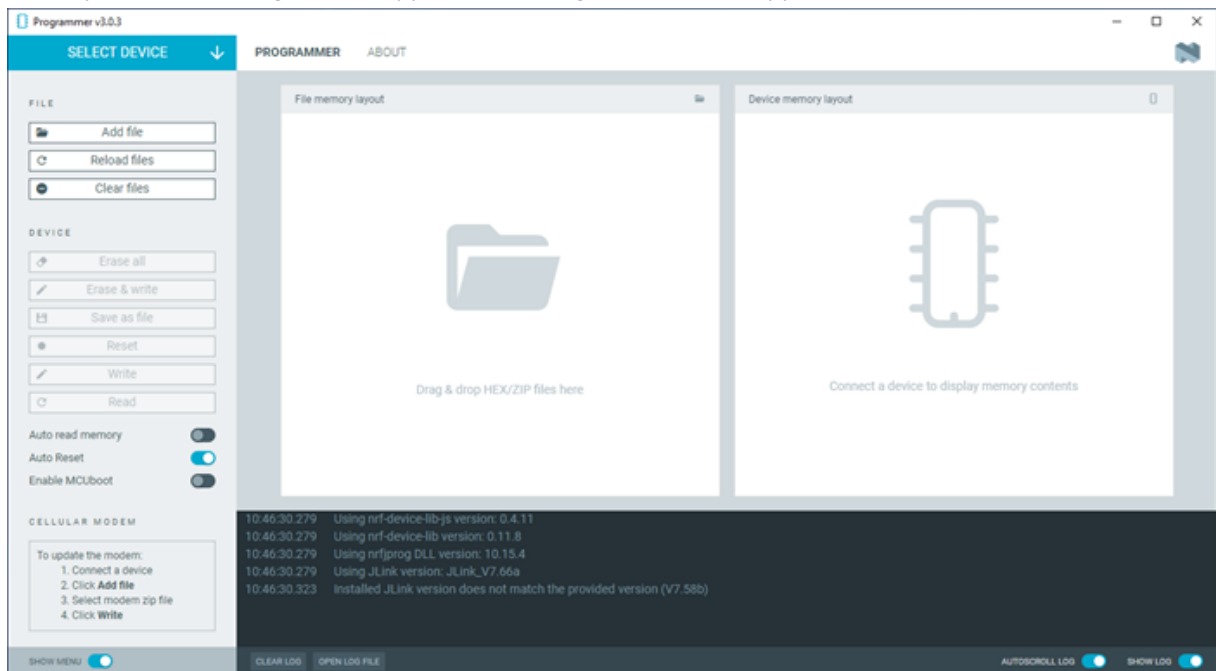


Figure 1: nRF Connect Programmer default view at startup

Select Device

Once you connect a device to the system, it becomes visible and available when you click on the **Select device** drop-down list. You can choose a device from the list of connected devices to perform further actions on the device such as programming.

You can switch between the following application Tabs, using the navigation bar.

Programmer tab

In the **Programmer** tab, you can see the memory sections for the selected device.

The **File Memory Layout** panel displays the memory layout for files added into the Programmer app with the **Add file** option. Once added, these files can be programmed onto the device.

Both windows display the different sections in the memory with different colors.

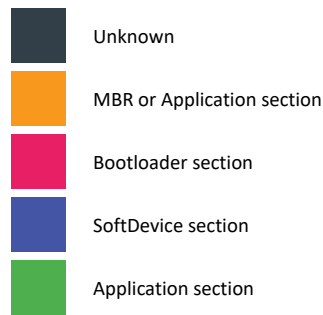


Figure 2: Memory layout section colors

Device

When you select a device, the following actions are available in the Device panel:

- **Erase all** clears the written memory on the device.
- **Read** reads and displays the written memory in the **Device Memory Layout**.
 - In the **Device Memory Layout**, you can read the name, address range, and size of a memory section by hovering the mouse cursor over one of the memory sections. This option is possible only after loading a memory layout.

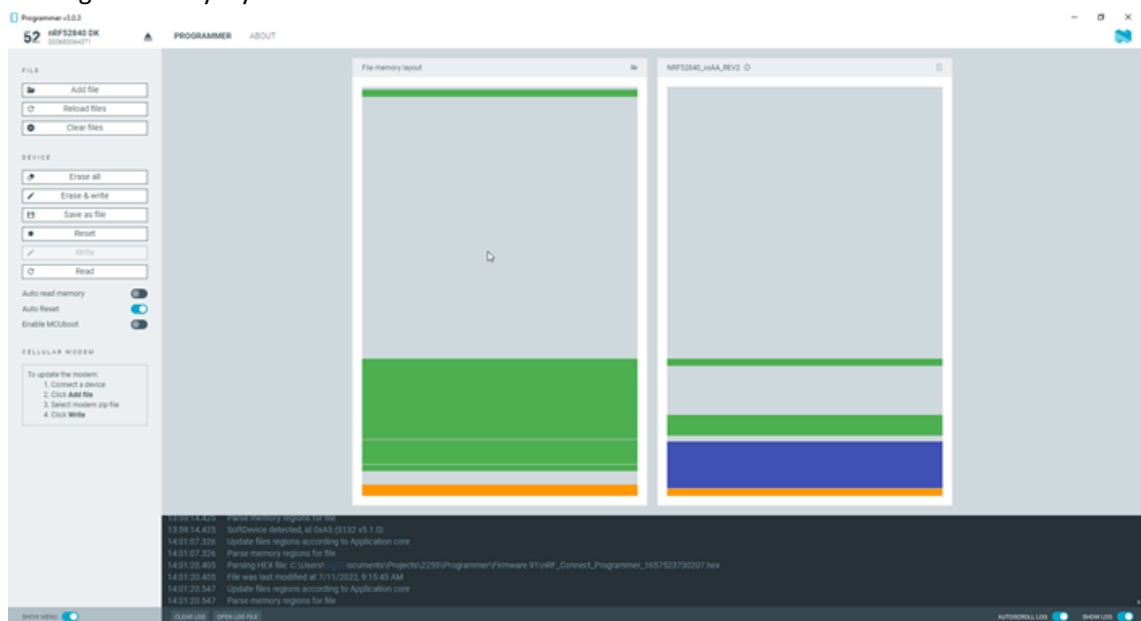


Figure 3: Memory section details

- Additionally, after you read the memory, **Save as file** allows you to save the memory as a HEX file.
- **Reset** resets the device.
- **Write** programs the files added to the **File Memory Layout**.
- **Erase & write** clears the written memory and programs the files added to the **File Memory Layout**.
- To automatically read and display the memory layout of the device, when the device is selected, enable **Auto read memory**.
- To automatically reset the device after it has been programmed, enable **Auto Reset**.
- To program a Nordic USB device, **Enable MCUboot** maybe required to write to the device memory.

File

In the File section, you can add files to the **File Memory Layout** graphic, reload, and remove them.

When adding files with the **Add file** button, you can select the files either from the drop-down list of previous files or by browsing to the file destination.

About tab

You can view application information, restore defaults, access source code, and documentation. You also can find information on the selected device, access support tools, and enable verbose logging.

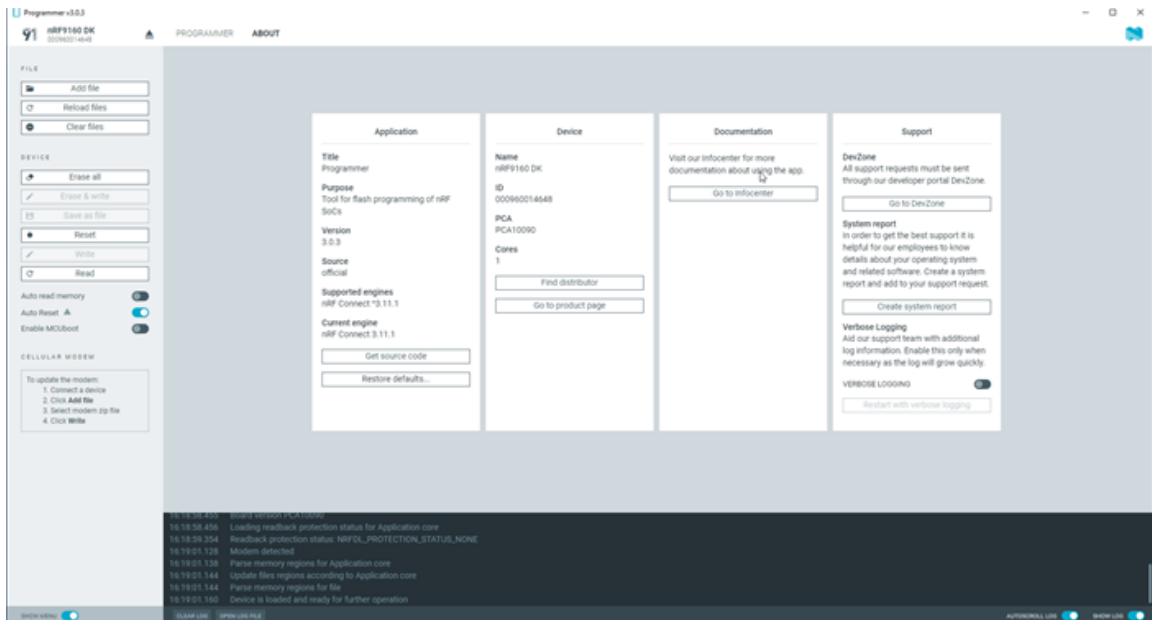


Figure 4: nRF Connect for Desktop Programmer About tab

Log

The Log panel allows you to view the most important log events, tagged with a timestamp. Each time you open the app, a new session log file is created. You can find the Log panel and its controls, below the main application Window.

- When troubleshooting, to view more detailed information than shown in the Log panel, use **Open log file** to open the current log file in a text editor.
- To clear the information currently displayed in the Log panel, use **Clear Log**. The contents of the log file are not affected.
- To hide or display the Log panel in the user interface, use **Show Log**.
- To freeze Log panel scrolling, use **Autoscroll Log**.

4

Programming a Development Kit or the nRF51 Dongle

In nRF Connect Programmer, you can program nRF91, nRF52, and nRF51 development kits, nRF51 Dongle, or a custom board with a supported chip that allows for communication with J-Link.

Note: When programming a custom board with a supported chip, make sure that the J-Link supports the relevant Arm[®] CPU. For example, an nRF52 Series DK cannot be used to program a Nordic Thingy:91 since the J-Link on an nRF52 Series DK does not support the programming of the Arm Cortex[®]-M33 CPU of Nordic Thingy:91. Also, a Nordic Thingy:52™ can be programmed only via J-Link and a 10-pin programming cable.

To program the nRF52840 Dongle, see [Programming the nRF52840 Dongle](#) on page 10. To program the nRF9160 DK, see [Programming the nRF9160 DK](#). To program any other development kit, the nRF51 dongle, or a custom board, see the following procedure.

1. Open nRF Connect for Desktop and launch [nRF Connect Programmer](#).
2. Connect a development kit to the computer with a micro-USB cable and turn it on.
3. Click **Select device** and select the device from the drop-down list.
The button text changes to the name and serial number of the selected device, and the **Device Memory Layout** section indicates that the device is connected.
4. If you have not selected the **Auto read memory** option under the **Device** menu and wish to visually see the memory layout before you program, click **Read** in the menu. If you have selected it, the memory layout will update automatically.
5. Drag and drop the HEX file into the **File Memory Layout** section. Alternatively, click **Add file** to add the files you want to program, by using one of the following options:
 - Select the files you used recently.
 - If there are no recently used files, click **Browse** from the drop-down list.
6. Select the firmware image file (with the extension `.hex`) from the file browser that opens up.
7. Click **Erase & write** in the **Device** pane to program the device.

5 Programming the nRF52840 Dongle

Programming the nRF52840 Dongle in nRF Connect Programmer requires a different approach than programming the nRF51 Dongle.

To program the nRF52840 Dongle:

1. Open nRF Connect for Desktop and launch [nRF Connect Programmer](#).
2. Insert the nRF52840 Dongle into a USB port on the computer.
3. Put the dongle into bootloader mode by pressing the **RESET** button.

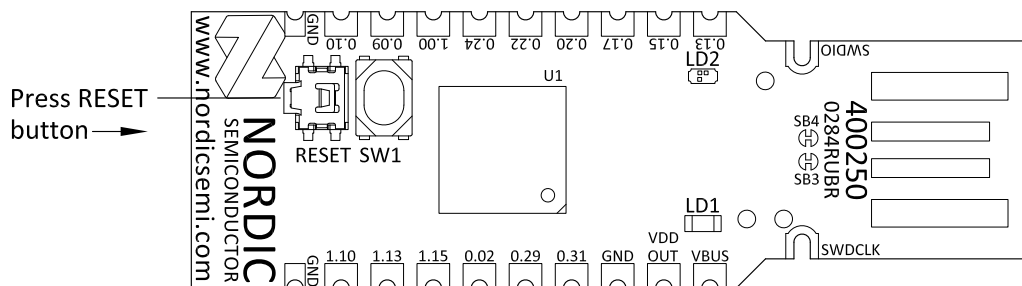


Figure 5: nRF52840 Dongle overview

Note:

- This step is not needed if the currently running application uses the DFU trigger library.
- If this is the first time the dongle is connected, a driver needed for the nRF52840 USB DFU feature is also installed as part of this step.

The status light (**LD2**) will start pulsing red, which indicates that the dongle is powered up and in bootloader mode. After a few seconds, the computer recognizes the dongle as a USB composite device.

4. In the navigation bar in the Programmer app, click **Select device** and select the serial number of the dongle from the drop-down list.
5. Drag and drop the HEX file into the **File Memory Layout** section. Alternatively, click **Add file** to add the files you want to program, by using one of the following options:
 - Select the files you used recently.
 - If there are no recently used files, click **Browse** from the drop-down list.
6. Select the firmware image file (with the extension `.hex`) from the file browser that opens up.
7. Click **Write** to program the firmware onto the dongle.

When the writing process completes, the device resets and – unless the application uses the DFU Trigger Library – the dongle will no longer show up in the Programmer app, as it is no longer in the bootloader mode.

6 Troubleshooting

When troubleshooting, to view more detailed information than shown in the Log panel, use **Open log file** to open the current log file in a text editor.

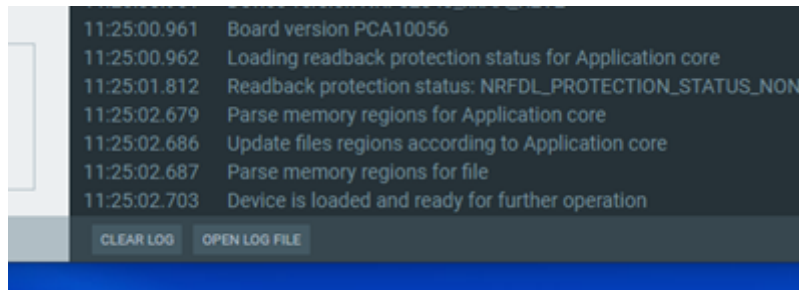


Figure 6: Where to open the detailed log file

The Programmer app shares several of the troubleshooting issues and suggested solutions with the nRF Connect *Bluetooth*[®] Low Energy app. Refer to the troubleshooting section in the [nRF Connect Bluetooth Low Energy](#) user guide for the list of issues.

Programming a device

If you are unable to program a device with the **Write** button, verify that:

- You are trying to program a supported device.
- There are no issues with the HEX file, and the addresses mentioned within the file are correct.

Restarting the Programmer app

You can restart the Programmer app by pressing **Ctrl+R** in Windows and **command+R** in macOS. A restart might be required in the following scenarios:

- A device is reset while it is connected to the Programmer app. In this case, you may not see all COM ports in the drop-down list while selecting the device (e.g., nRF9160 DK) in the Programmer app.
- Other errors.

Legal notices

By using this documentation you agree to our terms and conditions of use. Nordic Semiconductor may change these terms and conditions at any time without notice.

Liability disclaimer

Nordic Semiconductor ASA reserves the right to make changes without further notice to the product to improve reliability, function, or design. Nordic Semiconductor ASA does not assume any liability arising out of the application or use of any product or circuits described herein.

Nordic Semiconductor ASA does not give any representations or warranties, expressed or implied, as to the accuracy or completeness of such information and shall have no liability for the consequences of use of such information. If there are any discrepancies, ambiguities or conflicts in Nordic Semiconductor's documentation, the Product Specification prevails.

Nordic Semiconductor ASA reserves the right to make corrections, enhancements, and other changes to this document without notice.

Life support applications

Nordic Semiconductor products are not designed for use in life support appliances, devices, or systems where malfunction of these products can reasonably be expected to result in personal injury.

Nordic Semiconductor ASA customers using or selling these products for use in such applications do so at their own risk and agree to fully indemnify Nordic Semiconductor ASA for any damages resulting from such improper use or sale.

RoHS and REACH statement

Complete hazardous substance reports, material composition reports and latest version of Nordic's REACH statement can be found on our website www.nordicsemi.com.

Trademarks

All trademarks, service marks, trade names, product names, and logos appearing in this documentation are the property of their respective owners.

Copyright notice

© 2022 Nordic Semiconductor ASA. All rights are reserved. Reproduction in whole or in part is prohibited without the prior written permission of the copyright holder.

