Bluetooth® Low Energy Module (Nordic nRF54L series)

Firmware Writing Manual

Revision 1.0
06-Feb.2026

Revision History

date	rev.	comment
06-Feb.2026	1.0	Release

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1 Introduction

1.1 Security features of the Nordic nRF54L series

Nordic's nRF54L series includes a robust APPROTECT function to prevent unauthorized reading of internal information and to counteract fault injection attacks.

APROTECT initial state	remark
Disable	Debugging functionality is enabled
Enable	Debugging functionality is disabled

Note
When the APPROTECT function is enabled, data readout is disabled and debugging such as memory access is not possible.

1.2 APPROTECT function operation overview

Nordic's nRF54L series has the following registers related to the APPROTECT function.

APPROTECT disable	APPROTECT enable
APPROTECT **[0] Protect0 : 0xFFFFFFFF** ***APPROTECT*** **[0] Protect1 : 0xFFFFFFFF**	Other than left column

When initially shipped, APPROTECT is enabled.
There are two ways to disable APPROTECT.

- Set APPROTECT register in firmware

note:This cannot be used at the time of initial write. Initialize the module with the following command.

- Initialize the module with the “recover” command of nRF Util.

For details, please refer to "9.2 Access port protection" in the Product Specification document for each chip on the Nordic web page.

1.3 List of modules

The following modules are covered.

[Part number of the appropriate modules]

EC4L15BA1	EC4L10BA1	EC4L05BA1
ES4L15BA1		

2 APPROTECT setting

2.1 Requirements

This manual assumes the use of the following.

[tool]
- nRF Util (see Nordic TecDocs for details)
- VSCode (Visual Studio Code)

> **Note**
> Please use the latest version of nRF Util
> **https://www.nordicsemi.com/Products/Development-tools/nRF-Util**

[SDK (Software Development Kit)]
- nRF Connect SDK (developing environment : VSCode)

2.2 How to set up the APPROTECT function

Nordic's nRF54L series is shipped with the APPROTECT function enabled, so the firmware cannot be written as it.
Please execute the following commands using nRF Util.

```
nrfutil device recover
```

This will disable the APPROTECT feature and allow you to continue writing firmware.
Issuing recover using nRF Util will disable APPROTECT and retained after reset.

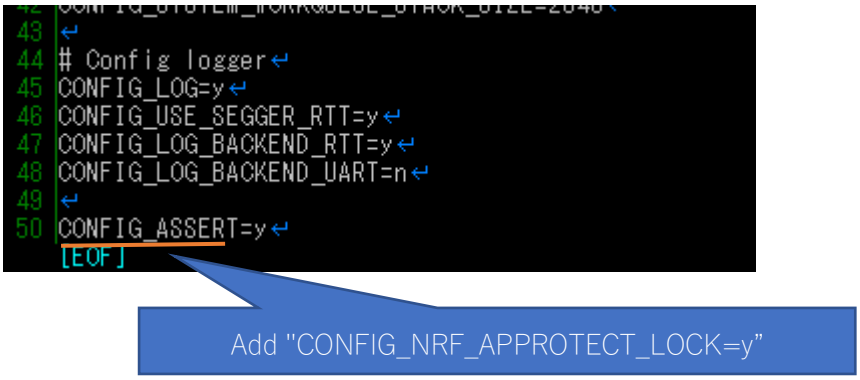
> **Note**
> The nrfutil device recover command erases the flash memory and then writes a firmware into the recovered flash memory. This firmware prevents the readback protection from enabling itself again after a pin reset or power cycle.
> When the erase command is issued, the APPROTECT setting area is also erased (0xFF), thus returning to the enabled setting.

3 When developing new software

For new software development, please use the latest nRF Connect SDK. Please refer to the following chapters based on the development environment and settings to be used.

3.1 APPROTECT enable

Enable the APPROTECT function in the compile options.
Add "CONFIG_NRF_APPROTECT_LOCK=y" to the "prj.conf" file of the project.



3.2 APPROTECT disable

Add "CONFIG_NRF_APPROTECT_DISABLE=y" to the "prj.conf" file of the project.