

# Flashing Firmware to Nordic Thingy

User Guide – Version 1.01

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# 1.0 Overview

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The goal of this guide is to provide a step by step guide on how to flash your *Nordic Thingy:52 IoT Sensor Kit* with a **Knowledge Pack**

## Prerequisites

- *Nordic Thingy:52 IoT Sensor Kit*
- *Nordic NRF52 Development Kit*
- *10-pin JTAG/SWD cable* for connecting to the Development Kit

## 2.0 Preparing Your Device for the First Time

Before you can flash a Knowledge Pack you need to remove the bootloader.

### Windows

- Install nRFgo Studio

Available here: <https://www.nordicsemi.com/eng/Products/2.4GHz-RF/nRFgo-Studio>

### Linux

- NRF-Command-Line-Utils
- J-Link Software and Documentation Pack

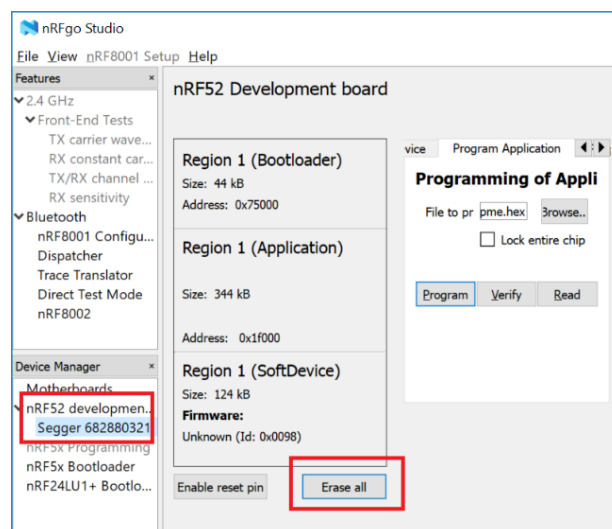
### Attach the debug board

1. Attach the debug board using the JTAG/SWD cable to debug out on the NRF52 DK and into the JTAG/SWD port on the thingy52.

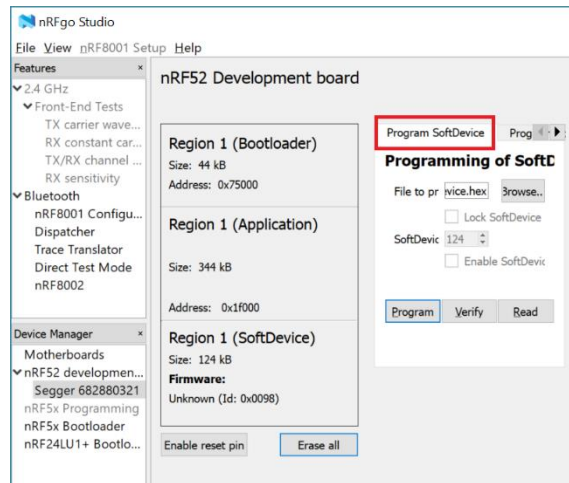


### Method 1: Prepare the device for flashing using nRFgo Studio

1. Select the **nrf52 bootloader**, and click **erase all**



2. Open the **Program SoftDevice** tab and select the **s132\_nrf52\_4.0.2\_softdevice.hex** file provided with the SensiML toolkit



3. Click **Program**

## Method 2: Prepare the device for flashing using the Command Prompt

To prepare the device without using nRFGo Studio you can use the nrf command line utilities. *(The command line utilities automatically get installed with the nRFGo Studio install, but you can install them separately)*

1. Open the command prompt
2. **Flash the SoftDevice** with the following command

```
nrfjprog --program <path to s132_nrf52_4.0.2_softdevice.hex> -f nrf52 --chiperase
```

## 3.0 Flashing a Knowledge Pack J-Link

**Important:** After you flash a device with a **Knowledge Pack** it will disable the option for collecting raw sensor data from that device in the SensiML Data Capture Lab. We include steps to reenabling data collection in [Reenabling Data Collection](#)

### Attach the debug board

1. Attach the debug board using the JTAG/SWD cable to debug out on the NRF52 DK and into the JTAG/SWD port on the thingy52.



### Method 1: Flash a Knowledge Pack using Analytics Studio

1. Import the **Flash widget** using the following command (If you are using the **Dashboard** widget you can skip this step, the flash widget gets loaded automatically in the **Dashboard**):

```
FlashWidget(dsk).create_widget()
```

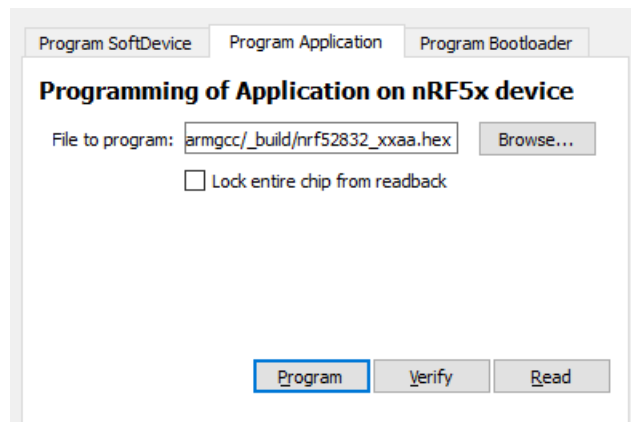
2. Select the Platform **Nordic Thingy 2.1**
3. Select the **Knowledge Pack binary file** you want to flash
4. Click **Flash**

#### ▼ Deploy Knowledge Pack

Platform	<input type="text" value="Nordic Thingy 2.1"/>	Nordic Firmware for Thingy:52 SDK 2.1.x, Using ARM-GCC Compiler
Binary	<input type="text" value="kp_bin_0f874ad5-95f3-49a9-9215-5c2f622ab05e_Nordic-Thingy_2.1_d.hex"/>	<input type="button" value="Refresh"/>
Flash Method	<input type="text" value="Jlink"/>	<input type="button" value="Flash"/> <input type="button" value="Generate OTA"/>

## Method 2: Flash a Knowledge Pack using nRFgo Studio

1. Open nRFgo Studio
2. Flash the knowledge pack by going to the **Program Application** tab and selecting your **Knowledge Pack** binary file



3. Click **Program**
4. Your device is now flashed with a SensiML **Knowledge Pack**

## Method 3: Flash a Knowledge Pack using the Command Prompt

To quickly flash devices without using nRFgo Studio you can use the nrf command line utilities. *(The command line utilities automatically get installed with the nRFgo Studio install, but you can install them separately)*

1. Open the command prompt
2. Flash the device with a new **Knowledge Pack** using the following command:

```
nrfjprog --program <path to Knowledge Pack> -f nrf52 --sectorerase
```

This will allow for rapid flashing of the device when iterating through models.

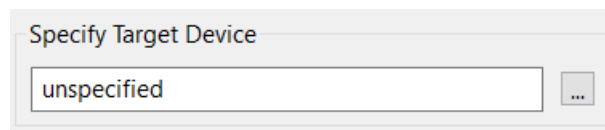
## 4.0 Debugging a Knowledge Pack

When you build a Knowledge Pack you have the option of turning on a **Debug** flag that gives you extra debugging information about the event classifications. Make sure you select Debug to **True** and have **Serial** output selected in the **Generate Knowledge Pack** widget

Sample Rate	100	▼	Output	BLE LED <b>Serial</b>
Debug	True	▼		
Test Data	None	▼		

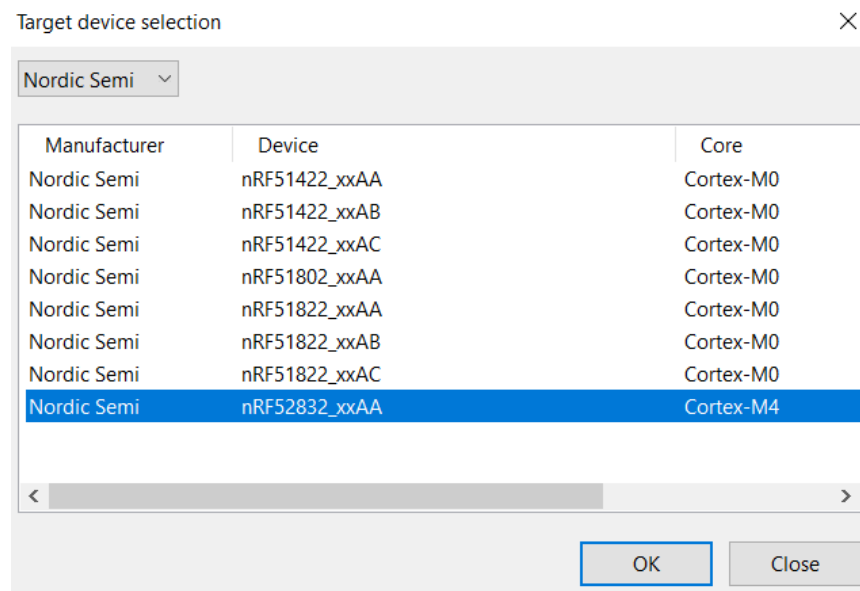
Follow the steps below to display the debug messages.

1. Open the **J-LINK RTT Viewer** application (*This gets installed with the nRFGo Studio install*)
2. Select your **target device**



A dialog box titled "Specify Target Device" with a text input field containing "unspecified" and a button with three dots "..." to its right.

3. Select **Nordic Semi** from the dropdown and then select **nRF52832\_xxAA**

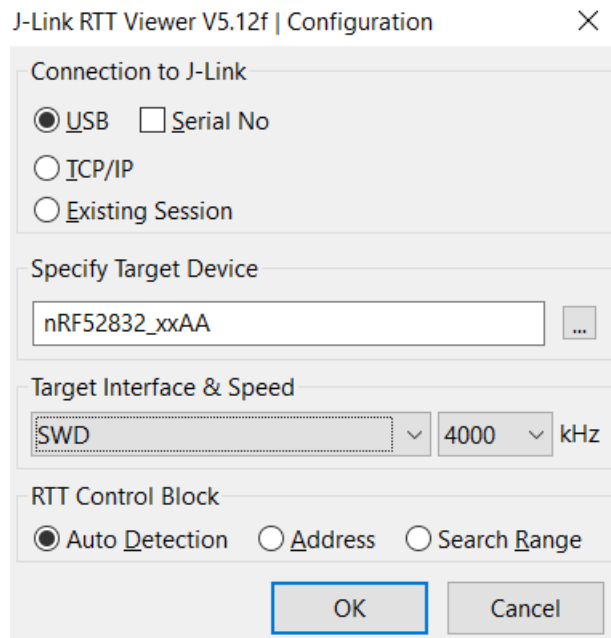


A dialog box titled "Target device selection" with a close button (X) in the top right corner. It features a dropdown menu at the top set to "Nordic Semi". Below is a table with three columns: Manufacturer, Device, and Core. The table lists several Nordic Semi devices, with "Nordic Semi nRF52832\_xxAA Cortex-M4" highlighted in blue. At the bottom are "OK" and "Close" buttons.

Manufacturer	Device	Core
Nordic Semi	nRF51422_xxAA	Cortex-M0
Nordic Semi	nRF51422_xxAB	Cortex-M0
Nordic Semi	nRF51422_xxAC	Cortex-M0
Nordic Semi	nRF51802_xxAA	Cortex-M0
Nordic Semi	nRF51822_xxAA	Cortex-M0
Nordic Semi	nRF51822_xxAB	Cortex-M0
Nordic Semi	nRF51822_xxAC	Cortex-M0
Nordic Semi	nRF52832_xxAA	Cortex-M4



4. Leave everything else as the default values and click **OK**



5. The RTT viewer will open the output window and you should now see the debug output from your **Knowledge Pack**

## 5.0 Reenabling Data Collection

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When you flash a device with a Knowledge Pack, it removes the ability to capture raw sensor data from a device.

We provide a copy of the base thingy application that has been signed with our own debugging key so that you can easily reset your device for capturing raw sensor data without needing to re-configure your device every time you need to switch to collecting raw sensor data.

### J-Link

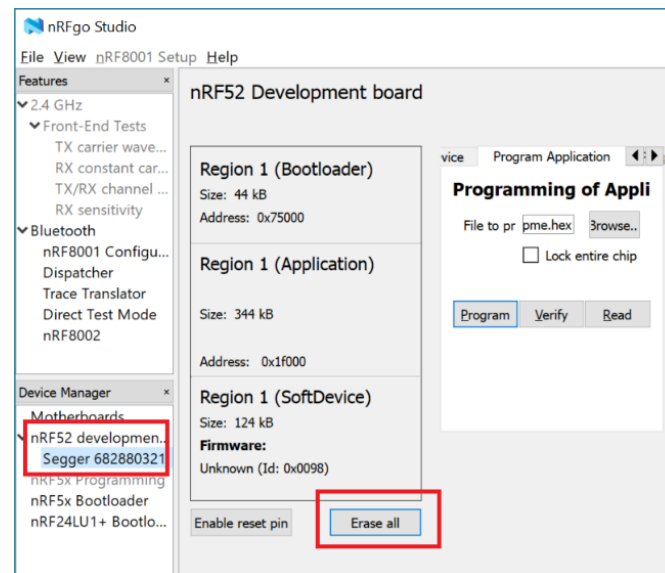
1. Find the zip file **thingy\_data\_collection.hex** included with the SensiML Toolkit
2. Follow the [J-Link](#) guide to flashing, **except** use the **thingy\_data\_collection.hex** file instead of a **Knowledge Pack hex file**

## 7.0 Factory Reset

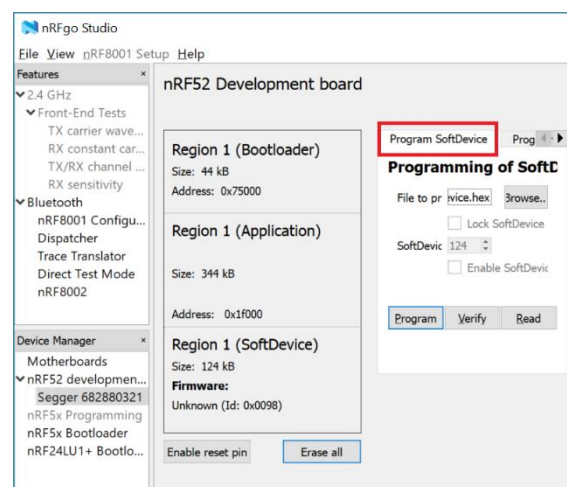
[Reenabling data collection](#) just resets the device to a base version of the firmware that we built without a Knowledge Pack. You can instead perform a **complete factory reset** by following the steps below.

### Reset via nRFgo Studio

1. Download the pre-compiled HEX file from <https://www.nordicsemi.com/eng/Products/Nordic-Thingy-52>
2. Select the **nrf52 bootloader**, and click **erase all**



3. Open the **Program SoftDevice** tab and select the **HEX** file



4. Click **Program**

## Reset via Command Prompt

1. Download the pre-compiled HEX file from  
<https://www.nordicsemi.com/eng/Products/Nordic-Thingy-52>
2. Open the command prompt
3. **Flash the SoftDevice** with the following command

```
nrfjprog --program <path to HEX file> -f nrf52 --chiperase
```