

Embedded Planet	Atlas	Programming Over USB
Date: 12 June 2020	Document Version: 0.2.0	Prepared by: V.Farren



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1 Introduction

This document details the process of preparing the Atlas board and PC for programming over USB. A JLink is required for initial programming of the bootloader. After the bootloader is flashed, Atlas may be programmed indefinitely over USB. Instructions for programming the Blinky and Dweet applications are included

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Contents

1	Introduction	1
2	Revision History	3
3	Preparing Atlas (skip this step if bootloader is already programmed)	3
4	Preparing the PC	4
4.1	Download Programming Software from Nordic	4
4.2	Run nrfConnect	4
4.3	Open Programmer	4
4.4	Select device from Drop Down.....	4
5	Atlas Dweet Application	5
6	Notes	6

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2 Revision History

Date	Description	Author	Version
08 JUNE 2020	Initial Release	V.Farren	0.1.0
12 JUNE 2020	Update Image and Instructions	V.Farren	0.2.0

3 Preparing Atlas (skip this step if bootloader is already programmed)

Figure 1: The Atlas Development Board



- Locate J14 near the USB ports and short PRGM pin to center pin with jumper
- Plug USB from PC into USB port labelled nRF PRGM
- Attach JLink to the header labelled 'Cortex Debug'
- Open J-Flash Lite and select NRF52840_XXAA from the box labelled 'Device'
- Click OK
- Click Erase Chip
- In the 'Data File' box select the 'Atlas-bootloader.hex' file
- Click Program Device
- After file is downloaded, remove Jlink and USB cable
- Re-insert USB cable
- Pulsing red LED on Atlas confirms that procedure has worked

4 Preparing the PC

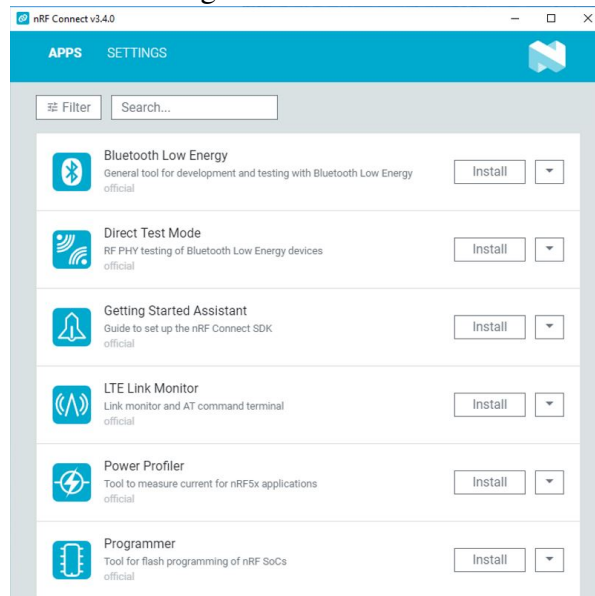
4.1 Download Programming Software from Nordic

- Download nrfConnect from Nordic
- [nrfConnect](#)

4.2 Run nrfConnect

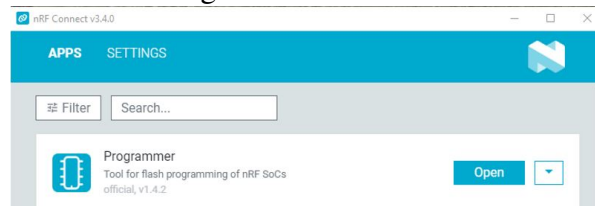
- Install 'Programmer'

Figure 2: nrfConnect



4.3 Open Programmer

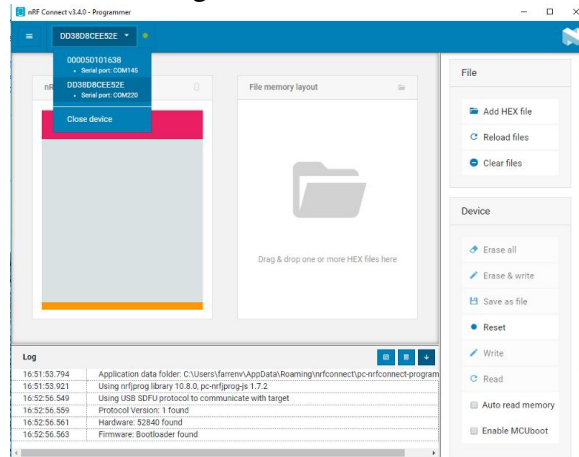
Figure 3: nrfConnect



4.4 Select device from Drop Down

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Figure 4: nrfConnect



- Click 'Add HEX file'
- select 'Atlas-Blinky_x_x_x.hex'
- click 'Write'
- The Blinky application requires a one-time extra power cycle to enable all three LEDs. This is due to runtime configuration that requires a reset to take effect. After that reset, all three LEDs will fade in and out during the Blinky example.
- To put Atlas into programming mode, press the Reset button
- To put Atlas into application execution mode, cycle power by removing the USB cable

5 Atlas Dweet Application

- Ensure that Chronos is correctly installed referencing the Atlas image above.
- Ensure that the taoglass cellular antenna is installed on the UFL connector labelled 'CELL'
- Ensure that you have inserted a Telit SIM card into Chronos with the metallic face facing the board. Insert the end with the shunted corner first.
- Other SIM cards will work with Chronos, but the example application works only with Telit SIMs.

The Atlas-Dweet_x_x_x.hex can be flashed in the same way as blinky. In the nRF Connect Programmer application first click 'Clear files'. This will remove the blinky application. Then use 'Add HEX file' to choose the Atlas-Dweet_x_x_x.hex file. This application features debug information over serial. After flashing this program, Atlas will populate as a COM port on your

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PC. Use a terminal emulator program such as Tera Term to open the COM port at 115200 baud. The other default settings are fine. You will need to modify how the terminal emulator handles the printing of new lines. Here are instructions for modifying this in three popular terminal emulators:

- Tera Term
 - Go into Setup, then Terminal. In the New-line box select Receive: LF and Transmit: CR+LF
- Real Term
 - In the display tab check the box "newLine mode"
- Putty
 - Under Terminal check "Implicit CR in every LF"

After opening the COM port and seeing serial data streaming, cycle power to Atlas. You need to do this because the first item that is printed over the serial port is the Dweet address that temperature data will be transmitted to. This address is composed of the MAC address of the nRF52840 found on the Atlas board and is unique to your board. Copy and paste this address into a web browser to see the temperature data graphed. The temperature sensor is next to the LED and is clearly marked on the PCB as a graphic of mercury thermometer. Place your finger on the thermometer to increase the temperature sensed and notice the effect on the data on the dweet page.

Figure 5: Example of Printed Dweet address

```
Device Dweet Address: https://dweet.io/follow/Atlas\_3637437742
[NWKH] Connecting to network...
```

6 Notes

When developing applications for Atlas to be programmed using the Nordic Bootloader, it is critically important that two configurations are preserved. In the project directory there is a file named "mbed_app.json". If the following two configurations are not present there in the following form, then the Nordic bootloader will be overwritten and the programming-over-USB functionality will be lost. It can always be reinstalled using a Jlink and the method described in this document.

```
"target.mbed_app_start": "0x1000",
"target.mbed_app_size": "0xDF000"
```