F150.Fw: How to upgrade the firmware

How to upgrade the firmware of the F150 with SBSFU.

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References

- STMicroelectronics UM2262 Getting started with the XcubeSBSFU stm32cube expansion package
- STMicroelectronics DM00556294 OverTheAir application and wireless firmware update for STM32WB series microcontrollers

Overview

How to upgrade the firmware in the F150 device with SBSFU.

Firmware Upgrade Over The Air

On the Bootloader

SBSFU can invoke the ST BLE OTA loader. It can be accessed in two ways:

- If there is no valid firmware application in the device, SBSFU will start the BLE OTA project.
- By invoking the upgrade from the application (see reboot_request below).

This version of the BLE OTA allows upgrades of:

- user application
- FUS
- BLE stack

On the application

The BLE profile in the application includes the ST BLE OTA service. This BLE OTA can only be used to upgrade the Firmware Application.

Also, the Fenom Plus service has a reboot_request characteristic, to invoke the Bootloader:

- reboot_request
- UUID = 0000FE11-8e22-4541-9d4c-21edae82ed19
- write without response

- size = 3 bytes

Usage

- Sending **0x01xxxx** to reboot _request char:
  - The last 2 bytes are *Do Not Care*.
  - Starts the Bootloader, erases the download slot (in the external flash), and launches BLE OTA.
  - If upgrading the stack, the application will still be there.
  - If no upgrade happens, reset the board with the 10-sec hold -> application firmware will be there.
- Sending **0x00xxxx** to reboot _request char:
  - The last 2 bytes are *Do Not Care*.
  - The device reboots to validate and run the user application.

Upgrade using the Python test script

The Python test script can be found in the Tools folder inside the Release packages,

Prerequisites

- Python 3.8 or higher
- Pip
-
  ```
  1  pip install -r requirements.txt
  ```

Usage

Run the script with

```
1  \Tools> python fuota.py -b <device BDADDRESS> <path to the OTA file>
```

for example:

```
1  \Tools> python fuota.py -b c1:0a:40:00:40:04 ../Binaries/CaireDiagnostics-F150-App-v99.37.167269302.sfb
```

Expected

The console for the script should show the progress as follows:

```
1   >python fuota.py -b c1:0a:40:00:40:04 ../Binaries/CaireDiagnostics-F150-App-v99.37.167269302.sfb
2   ** FUOTA: BLE Firmware Update Over The Air vALPHA (win32) **
3    Usage:
4        - Ctl-C to exit
5   > sending firmware: CaireDiagnostics-F150-App-v99.37.167269302.sfb
6   > connecting to c1:0a:40:00:40:04F... CONNECTED!
7   >> Registering for notifications
8   >> Sending APPLICATION_UPLOAD
9   > Device: Ready to receive File! - Starting transfer.
10  >> Starting the file transfer
11  [1]240/253408 => 0%
12  [2]480/253408 => 0%
13  [3]720/253408 => 0%
14  [4]960/253408 => 0%
15  [5]1200/253408 => 0%
16  ...
```

```
17    [1054]252960/253408 => 99%
18    [1055]253200/253408 => 99%
19    [1056]253408/253408 => 100%
20    > Image Fully queued in Host - Waiting for BLE Transfer to finish.
21    Do not close the script until the process finishes.
22    > Device: Finalized Image reception - Rebooting.
23    > disconnected!
24    > OTA took 336 sec. to send 253408 bytes at 0.74 kB/sec.
25    > done!
```

After a few seconds, the device should start the upgraded application firmware.