How to flash firmware to Artillery Ruby board

Tools:

Firmware compilation: Visual Studio Code, PlatformIO

Firmware upload: Pronterface, STM32CubeProgrammer

Procedure:

Step 1

Follow the guide at <u>https://marlinfw.org/docs/basics/install_platformio_vscode.html</u> to install PlatformIO with VSCode.

Step 2

Download the latest firmware at https://github.com/artillery3d/

Step 3

Extract the source file and put it in the root folder of C or D drive (DO NOT put in folders with space in the path).

Step 4

In PlatformIO, click on Open project and browse to the source code folder.





On bottom left of VSCode, click on PlatformIO:Build, PlatformIO will download the necessary files and compile the file. (It will take from a few minutes up to 30 minutes to download the necessary files for the first compilation, depends on the download speed of your internet connection, please be patience.)

You should see Success message when it compiled successfully.

| Environment | Status | Duration |
|----------------|---------|--------------|
| | | |
| artillery_ruby | SUCCESS | 00:00:30.325 |
| | | |

Use Pronterface to connect to the printer, and send command M997 to put printer into DFU mode, screen should turn black.



Step 7

Opens up Device Manager, scroll down and expand Universal Serial Bus controllers, you should see a device named STM Device in DFU Mode or STM32 BOOTLOADER, proceed to Step 15 if you see STM32 BOOTLOADER.

Step 8

Download and install DfuSe Demo

Step 9

Open Dfu File Manager, choose I want to GENERATE a DFU file from S19, HEX or BIN files and click OK



Click on S19 or Hex... then browse to [location of firmware source code]/.pio/build/artillery_ruby and choose firmware.hex

| 🗊 DFU File | Manager (v3.0.6) - | Generation | | | _ | | × |
|--|--|--|----------------------------|-------------|---------------------|--|---|
| Device | | Images | | | | | |
| Vendor II | | Injustion | | | | | |
| Product II Versio | | Injection Targe | et ID: 0 | <u>S</u> 19 | For Hex | <u>M</u> ulti BIN | |
| | | Target N | ame: ST | | | | |
| | | Deletion | | | <u>D</u> elete sele | cted Image | |
| | | | | | <u>G</u> enerate | <u>C</u> ancel | |
| Copen ← → × ↑ → Th Organize ▼ New fold | iis PC → Storage (D:) → Marlin-Hornet-ma er | ıster → .pio → build → artille | ery_ruby | | م <mark>ہ</mark> ب | × Search artillery_ruby IIII → III (2) | |
| 🗎 Documents 🖈 ^ | Name | Date modified | Туре | Size | | | |
| 🔤 Pictures 🖈 | FrameworkArduino | 5/26/2021 6:33 PM | File folder | | | | |
| FileRecv 🖈 | FrameworkArduinoVariant | 5/26/2021 6:32 PM | File folder | | | | |
| 2021年五月 | lib04e | 5/26/2021 6:33 PM | File folder | | | | |
| - Manual | lib8ce | 5/26/2021 6:33 PM | File folder | | | | |
| PDF | iib009 iib97b | 5/26/2021 6:33 PM 5/26/2021 6:33 PM | File folder File folder | | | | |
| Nork | libc42 | 5/26/2021 6:33 PM | File folder | | | | |
| 👝 OneDrive | libce9 | 5/26/2021 6:33 PM | File folder | | | | |
| | libfbf | 5/26/2021 6:33 PM | File folder | | | | |
| 🥑 Qsync | src | 5/26/2021 6:33 PM | File folder | | | | |
| 🔜 This PC | SrcWrapper | 5/26/2021 6:33 PM | File folder | | | | |
| 3D Objects | 📑 firmware.hex | 5/26/2021 6:33 PM | HEX File | 454 KB | | | |
| Desktop | | | | | | | |
| Documents | | | | | | | |
| Downloads | | | | | | | |
| Music | | | | | | | |
| Pictures | | | | | | | |
| 📳 Videos | | | | | | | |
| 📥 Local Disk (C:) | | | | | | | |
| 👝 Storage (D:) | | | | | | | |
| 🚍 Public (\\10.0.1 | | | | | | | |
| 🦨 Network 🛛 🗸 | | | | | | | |
| File <u>n</u> | ame: firmware.hex | | | | ~ hex | Files (*.hex) 🗸 🗸 | |
| | | | | | | Open Cancel | |

Click on Generate... and choose where to save the generated file.

| 🛃 Save As | | | | | | × |
|---|---------------------------------------|---------------------------------|-------------|--------|-----------|----|
| \leftrightarrow \rightarrow \checkmark \uparrow \square \Rightarrow Thi | s PC → Storage (D:) → Marlin-Hornet-m | aster > .pio > build > artiller | y_ruby | | | |
| Organize 👻 New folde | r | | | | | |
| 📰 Pictures 🛛 🖈 🔿 | Name | Date modified | Туре | Size | | |
| FileRecv 🖈 | FrameworkArduino | 5/26/2021 6:33 PM | File folder | | | |
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| Manual | lib04e | 5/26/2021 6:33 PM | File folder | | | |
| PDF | lib8ce | 5/26/2021 6:33 PM | File folder | | | |
| work | lib009 | 5/26/2021 6:33 PM | File folder | | | |
| O WOIK | lib97b | 5/26/2021 6:33 PM | File folder | | | |
| 📥 OneDrive | libc42 | 5/26/2021 6:33 PM | File folder | | | |
| Qsync | libce9 | 5/26/2021 6:33 PM | File folder | | | |
| Colyne | 🔜 libfbf | 5/26/2021 6:33 PM | File folder | | | |
| 💻 This PC | src . | 5/26/2021 6:33 PM | File folder | | | |
| 3D Objects | SrcWrapper | 5/26/2021 6:33 PM | File folder | | | |
| 🧮 Desktop | 📑 firmware.dfu | 5/26/2021 6:35 PM | DFU File | 162 KB | | |
| Documents | | | | | | |
| United Street Level 1 | | | | | | |
| Music | | | | | | |
| Pictures | | | | | | |
| Videos | | | | | | |
| | | | | | | |
| 🏪 Local Disk (C:) | | | | | | |
| 👝 Storage (D:) | | | | | | |
| 🚘 Public (\\10.0.1.' | | | | | | |
| File <u>n</u> ame: firmw | are.dfu | | | | | ~ |
| Save as type: Dfu Fil | les (*.dfu) | | | | | Ý |
| | | | | | | |
| ∧ Hide Folders | | | | | Save Canc | el |

Step 12

Open DfuSe Demo

Step 13

Click on choose and browse to and select the generated DFU file, also, check the 2 boxes Verify after download and Optimize Upgrade duration

| Available DFU Dev | rices | | | |
|---|----------------------|--|--|--|
| STM Device in DF | U Mode | ~ | Application Mode: | DFU Mode: |
| | | Manifestation tolerant Accelerated Upload (ST) | Vendor ID: | Vendor ID: 0483 Procuct ID: DF11 Version: 2200 |
| Enter DFU mode/ | 'HID detach | Leave DFU mode | | |
| Actions | | | | |
| Select Target(s): | Target Id | Name | Available Secto | ors (Double Click for more) |
| | 00 01 02 03 | Internal Flash Option Bytes OTP Memory Device Feature | 6 sectors 1 sectors 2 sectors 1 sectors | |
| Upload Action File: Choose | . Uj | Upgrade or V File: Vendor ID: Procuct ID: | erify Action Targets in | file: |
| Transferred data size 0 KB(0 Bytes) of 0 KB(0 Bytes) | | Verify afte | er download Upgrade duration (Ren | |
| Operation duratio | n 10:00:00 | Choose | | - |

Click on Upgrade and wait till it's done. And the firmware should be upgraded on the board.

Step 15

Download and install STM32CubeProgrammer from <u>https://www.st.com/en/development-tools/stm32cubeprog.html</u>

You don't need to register but need to fill in a correct email address to receive the actual download link for the program.

It will install the necessary driver during the installation process.

Step 16

Open STM32CubeProgrammer after sending M997 to mainboard.

Step 17

Choose USB in the drop-down menu in the top right corner



Step 18 Select USB 1 in Port drop-down menu, then click on Connect

| Prg STN | M32CubeProgrammer | | | - 🗆 X |
|---------------|---|-----------------------------|--------|---|
| STM32 Cube | 2 V eProgrammer | | | fi 🕒 🎐 🔆 🏹 |
| = | Memory & File edition | | | Not connected |
| | Device memory Open file + | | | USB 🗸 Connect |
| | Address 💽 👻 Size Data width 32-bit 👻 | Find Data 0x | Read 🔻 | USB configuration Port No DFU |
| OB | | | | Serial number No DFU detected |
| СРИ | | | | VID 0x0483 |
| swv | | | | Read Unprotect (MCU) |
| | No data to display | | | |
| | | Live Update Verbosity level | 1 2 3 | Target information |
| | 15:39:07 : STM32CubeProgrammer API v2.8.0 | Live Update Verbosity level | \$ | Device Type Device ID Revision ID |
| (1) (2) | | | 8 | Flash size _ CPU _ Bootloader Version _ |
| ? | | | 0% 😣 | |

Step 19

Click on second button on the left then click on browse to select the firmware.hex compiled in Step 5.

| Prg STM | 132CubeProgrammer | | - 🗆 X |
|---------------|---|--|--|
| STM32 Cube | Programmer | 1 | 1 🕨 🎽 🔆 🏹 |
| | Erasing & Programming | | Not connected |
| | www.load | Erase flash memory Erase external memory | USB Connect |
| . | File path Browse | Erase selected sectors Full chip erase | USB configuration Port No DFU |
| OB | Start addr 0x08000000 Skip flash erase before programming | Se Index Start Address Size | Serial number PID0xdf11 |
| СРИ | Verify programming | | VID 0x0483 |
| swv | Run after programming | | Read Unprotect (MCU) |
| | Automatic Mode | No sectors to display | |
| | Full chip erase | | |
| | Download file | | |
| | Option bytes commands -ob | | Target information |
| | Log 🗌 Li | ive Update Verbosity level | Board _ Device _ |
| | 15:39:07 : STM32CubeProgrammer API v2.8.0 | 4 | Type _ Device ID _ Revision ID _ |
| | | B | Flash size CPU |
| (1) (2) (2) | | | Bootloader Version _ |
| ? | | 0% 🛞 | |

Step 20 Check Verify programming then click on Start Programming button

| Prg STN | 132CubeProgrammer | | - 🗆 X |
|--|---|--|---|
| STM32 Cube | Programmer | (() | 1 🕨 🎽 🔆 🏹 |
| | Erasing & Programming | | Not connected |
| | Download | Erase flash memory Erase external memory | USB Connect |
| . | File path 🔹 Browse | Erase selected sectors Full chip erase | USB configuration Port No DFU |
| OB | Start addr 0x08000000 Skip flash erase before programming | Se Index Start Address Size | Serial number PID0xdf11 |
| СРИ | Verify programming | | VID 0x0483 |
| swv | Run after programming Start Programm Automatic Mode Full chip erase ✓ Download file Option bytes commands -ob | No sectors to display | Read Unprotect (MCU) |
| | | ive Update Verbosity level 💿 1 🔵 2 🔵 3 | Board _ Device _ Type _ |
| (a) (b) (c) (c) | 15:39:07 : STM32CubeProgrammer API v2.8.0 | * | Type - Device ID - Revision ID - Flash size - CPU - Bootloader Version - |
| \bigcirc | | 0% 🛞 | |