



M110 Firmware Upgrade

How to flash the M110 module over uart, USB, and SWD

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Category

Notices, fiches produits, manuels

Family

Famille 125K

Reference

PNA25092

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Ver.	Date	Author	Verifier	Approb.	Details
AA	2025-03-21	MBA	JDA	2025-03-26	Initial revision

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1 Firmware upgrade over USB or UART

1.1 Software requirements

M110 upgrade binaries shall be uploaded to the module using SpringCoreFlash, which is part of the SpringCoreTools suite (<https://www.springcard.com/en/download/find/file/sq20029>).

This tool is currently only available for the Microsoft Windows (intel) platform.

Please note that SpringCoreFlash is not able to define if an upgrade of the module is required or not and will overwrite any previously flashed firmware.

Note: VBUS has priority over UART on /RESET when /FLASH is asserted.

1.2 Flashing over UART

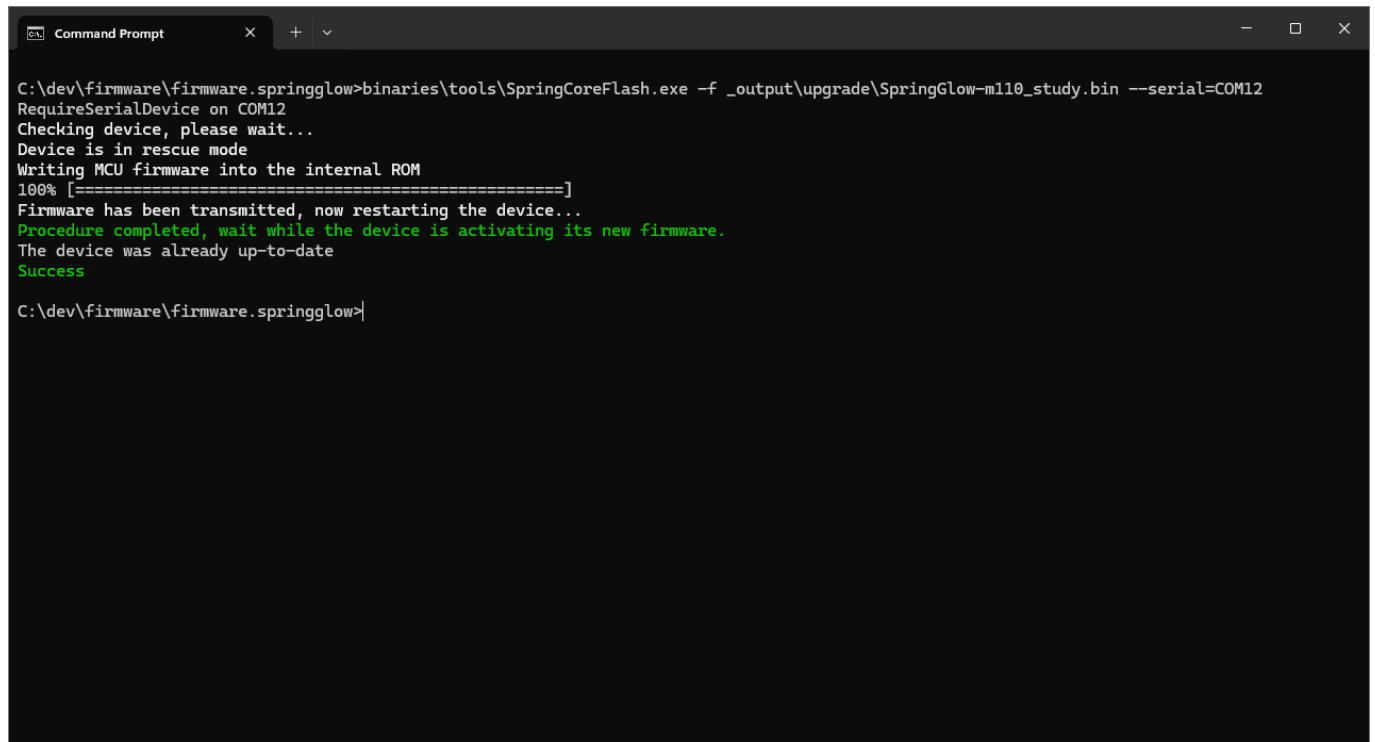
1.2.1 Connectivity

Pin	Symbol	Type	Description
# 10	/FLASH	In	Force DFU (bootloader) mode upon reset
# 11	/RESET	In	Reset the module
# 12	GND	Ground	
# 13	RX	In	Main UART, host to module
# 14	TX	Out	Main UART, module to host
# 24	VIN_3V3	Power	Digital power supply 3.3V

/FLASH is only probed by the bootloader on /RESET.

1.2.2 Performing the upgrade

`SpringCoreFlash.exe -f firmware_upgrade_file.bin --serial=COMxx`



```
Command Prompt
C:\dev\firmware\firmware.springglow>binaries\tools\SpringCoreFlash.exe -f _output\upgrade\SpringGlow-m110_study.bin --serial=COM12
RequireSerialDevice on COM12
Checking device, please wait...
Device is in rescue mode
Writing MCU firmware into the internal ROM
100% [=====]
Firmware has been transmitted, now restarting the device...
Procedure completed, wait while the device is activating its new firmware.
The device was already up-to-date
Success
C:\dev\firmware\firmware.springglow>
```

Please note that the bootloader will try to start the newly uploaded firmware at the end of the flash operation (regardless of the /FLASH pin's level).

1.3 Flashing over USB

1.3.1 Connectivity

Pin	Symbol	Type	Description
# 10	/FLASH	In	Force DFU (bootloader) mode upon reset
# 11	/RESET	In	Reset the module
# 12	GND	Ground	
# 19	USB_DM	USB	USB D- signal
# 20	USB_DP	USB	USB D+ signal
# 22	VBUS	USB	Digital power supply + USB presence, 5V

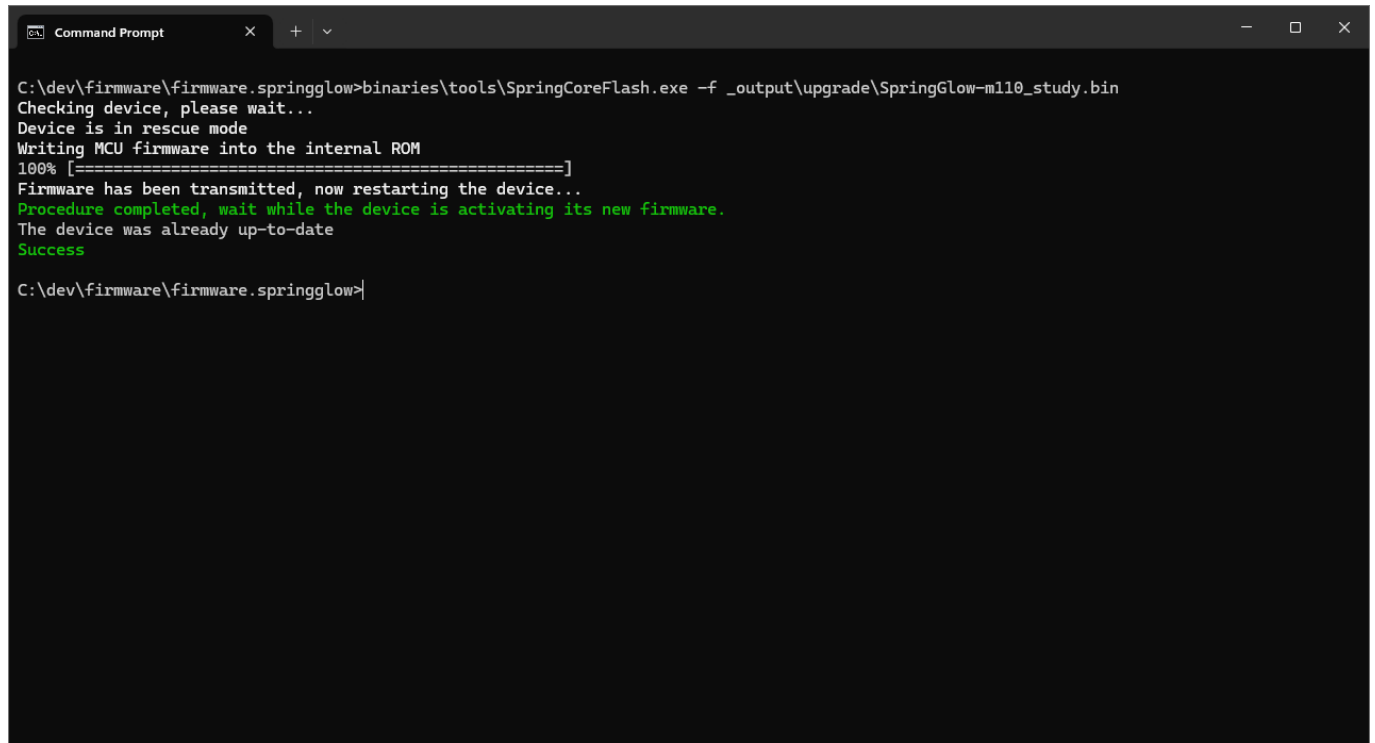
/FLASH is only probed by the bootloader on /RESET.

The device shall be detected as a SpringCard-DFU device when in DFU mode:

- > Storage controllers
- > System devices
- > Universal Serial Bus controllers
- ▼ Universal Serial Bus devices
 - Camera DFU Device
 - Picoprobe CMSIS-DAP v2
 - SpringCard-DFU
- > USB Connector Managers

1.3.2 Performing the upgrade

`SpringCoreFlash.exe -f firmware_upgrade_file.bin`



```
Command Prompt
C:\dev\firmware\firmware.springglow>binaries\tools\SpringCoreFlash.exe -f _output\upgrade\SpringGlow-m110_study.bin
Checking device, please wait...
Device is in rescue mode
Writing MCU firmware into the internal ROM
100% [=====]
Firmware has been transmitted, now restarting the device...
Procedure completed, wait while the device is activating its new firmware.
The device was already up-to-date
Success
C:\dev\firmware\firmware.springglow>
```

Please note that the bootloader will try to start the newly uploaded firmware at the end of the flash operation (regardless of the /FLASH pin's level).

2 Flashing using SWD

2.1 Software requirements

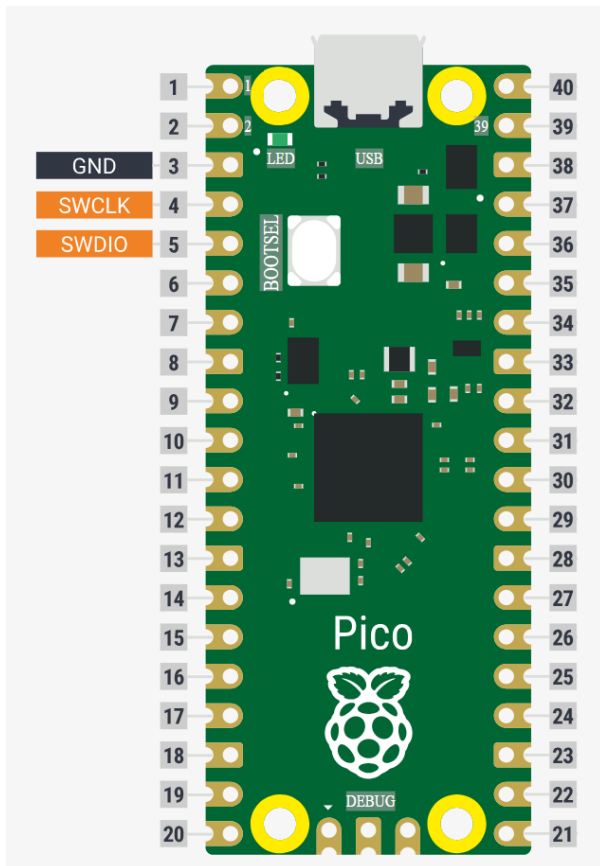
PicoProbe firmware for the Raspberry Pi Pico (RP2040 based only!).

OpenOCD version 0.12.0.

[Both to be provided in the relevant software package]

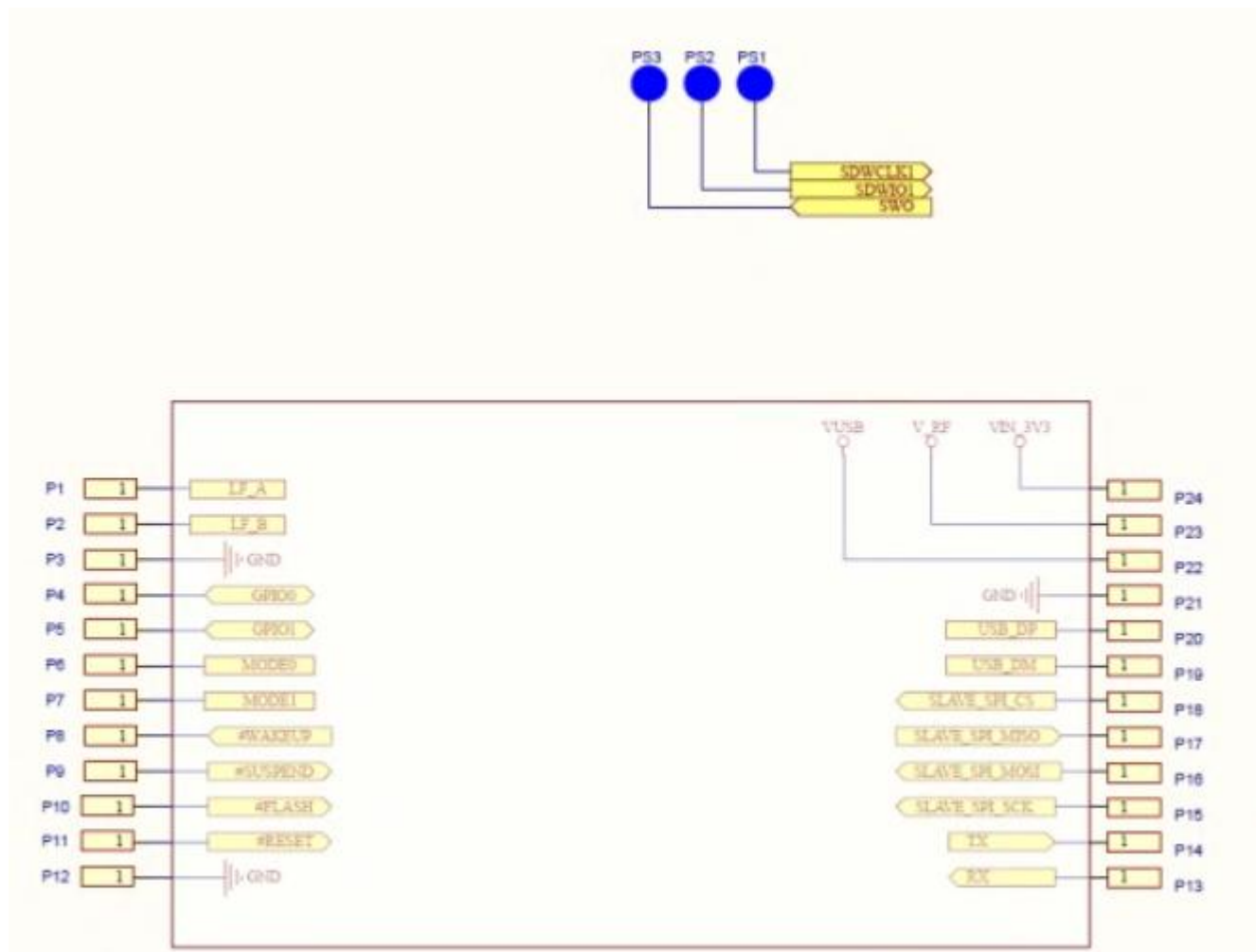
2.2 Hardware requirements

A Raspberry Pico (RP2040 based): <https://www.raspberrypi.com/products/raspberry-pi-pico/>



2.3 Connectivity

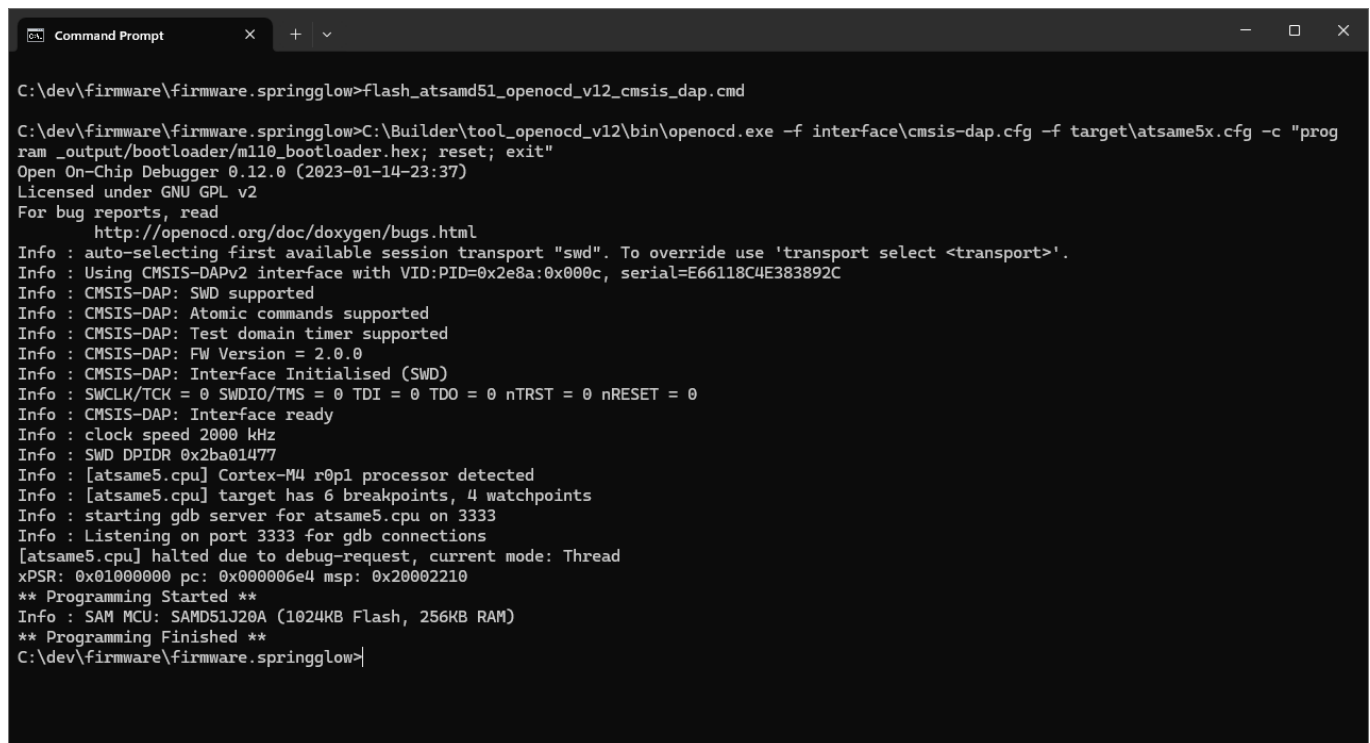
Pin	Symbol	Type	Description
# PS1	SWDCLK	SWD	Hardware programming Clock line
# PS2	SWDIO	SWD	Hardware programming Data line
# 12	GND	Ground	
# 24	VIN_3V3	Power	Digital power supply 3.3V



You shall not use the Pico's debug port!

M110's SWDCLK, SWDIO and GND shall be connected to the relevant Raspberry Pi Pico for programming.

2.4 Flash operation



```
C:\dev\firmware\firmware.springgflow>flash_atsamd51_openocd_v12_cmsis_dap.cmd

C:\dev\firmware\firmware.springgflow>C:\Builder\tool_openocd_v12\bin\openocd.exe -f interface\cmsis-dap.cfg -f target\atsame5x.cfg -c "program_output/bootloader/ml10_bootloader.hex; reset; exit"
Open On-Chip Debugger 0.12.0 (2023-01-14-23:37)
Licensed under GNU GPL v2
For bug reports, read
  http://openocd.org/doc/doxygen/bugs.html
Info : auto-selecting first available session transport "swd". To override use 'transport select <transport>'.
Info : Using CMSIS-DAPv2 interface with VID:PID=0x2e8a:0x000c, serial=E66118C4E383892C
Info : CMSIS-DAP: SWD supported
Info : CMSIS-DAP: Atomic commands supported
Info : CMSIS-DAP: Test domain timer supported
Info : CMSIS-DAP: FW Version = 2.0.0
Info : CMSIS-DAP: Interface Initialised (SWD)
Info : SWCLK/TCK = 0 SWDIO/TMS = 0 TDI = 0 TDO = 0 nTRST = 0 nRESET = 0
Info : CMSIS-DAP: Interface ready
Info : clock speed 2000 kHz
Info : SWD DPIDR 0x2ba01477
Info : [atsame5.cpu] Cortex-M4 r0p1 processor detected
Info : [atsame5.cpu] target has 6 breakpoints, 4 watchpoints
Info : starting gdb server for atsame5.cpu on 3333
Info : Listening on port 3333 for gdb connections
[atsame5.cpu] halted due to debug-request, current mode: Thread
xPSR: 0x01000000 pc: 0x000006e4 msp: 0x20002210
** Programming Started **
Info : SAM MCU: SAMD51J20A (1024KB Flash, 256KB RAM)
** Programming Finished **
C:\dev\firmware\firmware.springgflow>
```

Please note that we may only flash the bootloader using SWD and upload the firmware part using USB or uart.

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