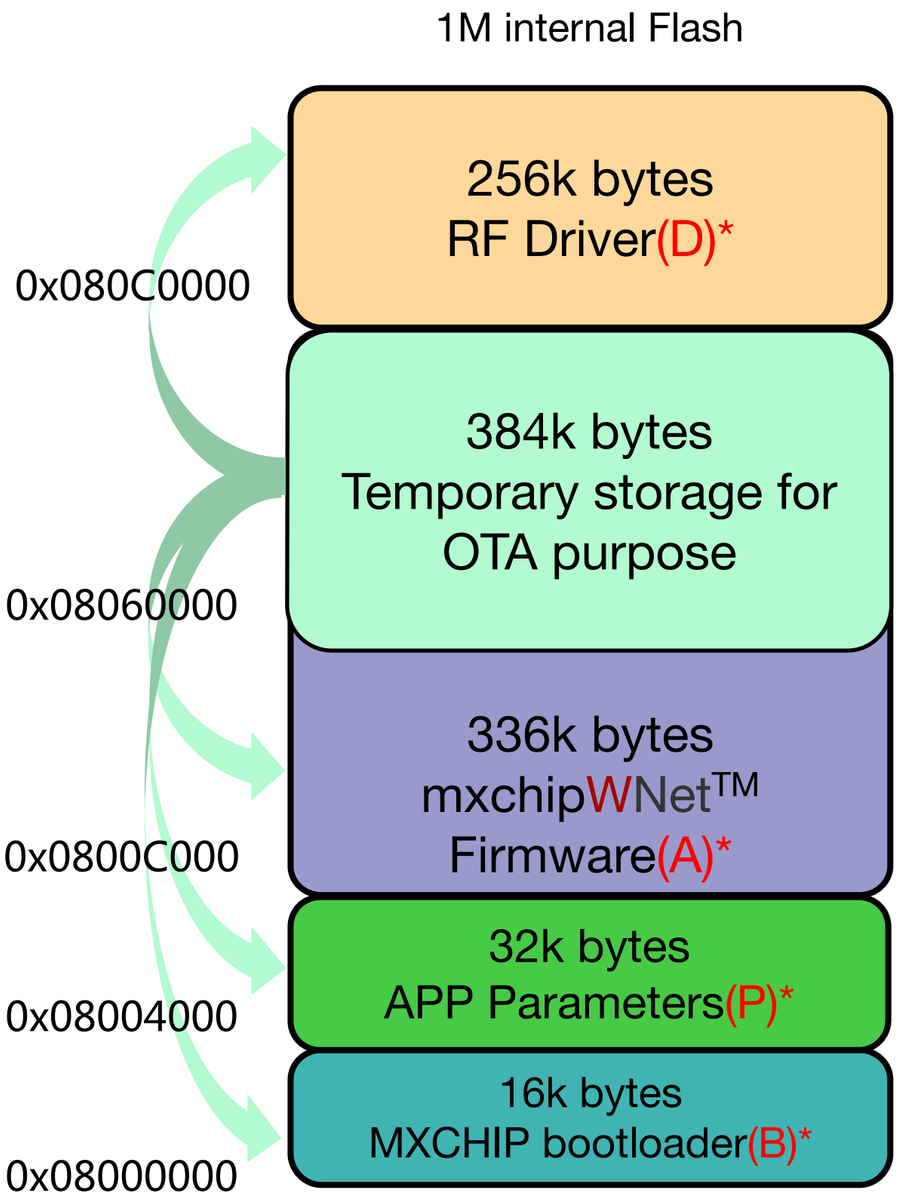
How to use Wi-Fi module

EMW316x Firmware Update Steps

Agenda

- Contents of the EMW316x internal flash
- Update using the MXCHIP bootloader
- Update using the ST ISP programmer
- Update using J-link and J-Flash
- Update using the build-in web server (OTA)

EMW316x Flash Memory Map



* Content Type

Start	End	Type	Size (bytes)	Content
0x08000000	0x08003FFF	B	16k	Bootloader
0x08004000	0x0800BFFF	P	32k	OTA info，user para.
0x0800C000	0x08060000	A	336k	User application
0x08060000	0x080C0000	–	384k	OTA temporary storage
0x080C0000	0x080FFFFF	D	256k	RF Driver

The Most Important Flash Parts

Wrong content will make the module not function

16k bytes
MXCHIP bootloader(B)*

- First executed code after reset
- Update flash contents using serial port
- Boot to mxchipWNet Firmware
- Download from www.mxchip.com
- Source code provided
- Current version: Version 4.0.1_WDG

336k bytes
mxchipWNet™
Firmware(A)*

- User's main application or firmware provided by MXCHIP

256k bytes
RF Driver(D)*

- RF driver, loaded to RF chip after initialized
- Download from www.mxchip.com

The version of the two parts should matched

Comparison

Update Method	Existed flash content	Module HW requirement	Extra hardware	Special software	Speed
MXCHIP bootloader	MXCHIP Bootloader	UART MXCHIP BOOT pin*	Serial cable	Serial terminal	Low
ST ISP programmer	No	UART ST BOOT pin*	Serial cable	ISP programmer from ST micro	Low
ARM Emulator	No	SWD(JTAG)	J-link	J-Flash	Middle
OTA	Bootloader mxchipWNet™ Firmware RF driver	Wi-Fi	No	User designed OTA server	High

Module	MXCHIP BOOT pin*	ST BOOT pin*
EMW3161	PIN 36	PIN 30
EMW3162	PIN 16	PIN 27

MXCHIP BOOT pin has connected to a switcher on EMW-380-S2 test board

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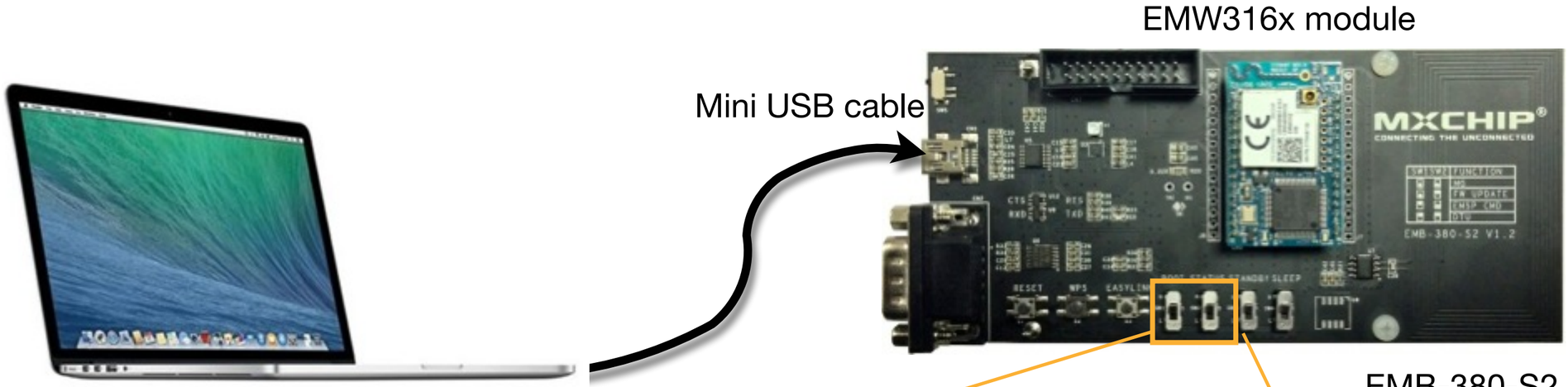
Update using the MXCHIP Bootloader (1)

Hardware Connection



BOOT(SW1)	STATUS(SW2)	Operation mode
L	L	Factory mode
L	H	Firmware update mode
H	L/H	Working mode

Update using the MXCHIP Bootloader (2)

Software Preparation

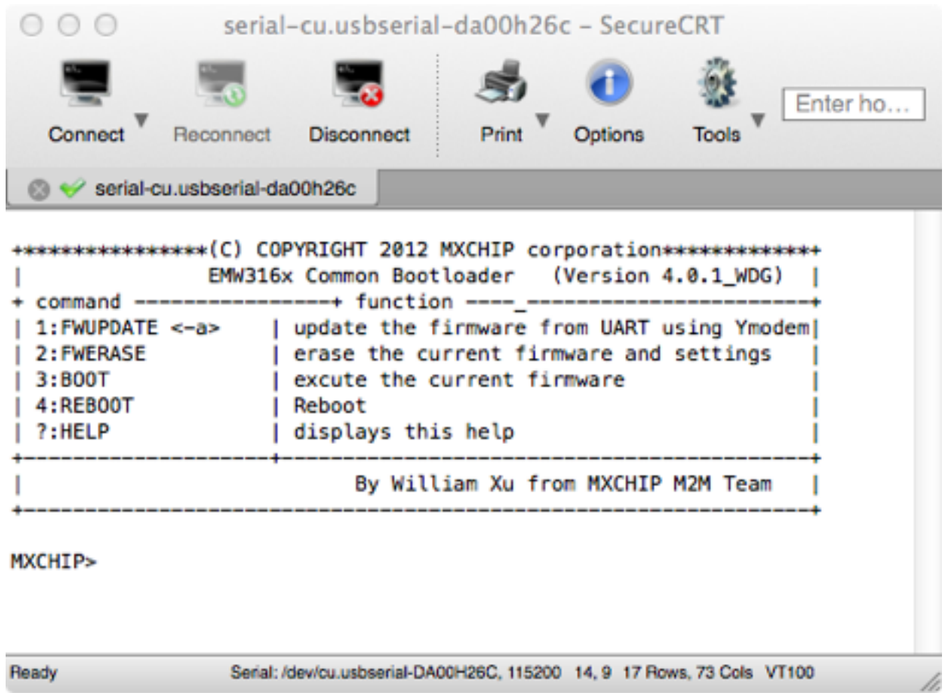
- USB driver: http://www.ftdichip.com/Drivers/VCP.htm
- A virtual serial port will appear after the driver is installed

Processor Architecture			
Operating System	**Release Date**	**x86 (32-bit)**	**x64 (64-bit)**
Windows 8.1	2013-10-21	2.08.30	2.08.30
Windows*	2013-08-01	2.08.30	2.08.30
Linux	2009-05-14	1.5.0	1.5.0
Mac OS X	2012-08-10	2.2.18	2.2.18

- Serial port terminal /w Ymodem file transmission

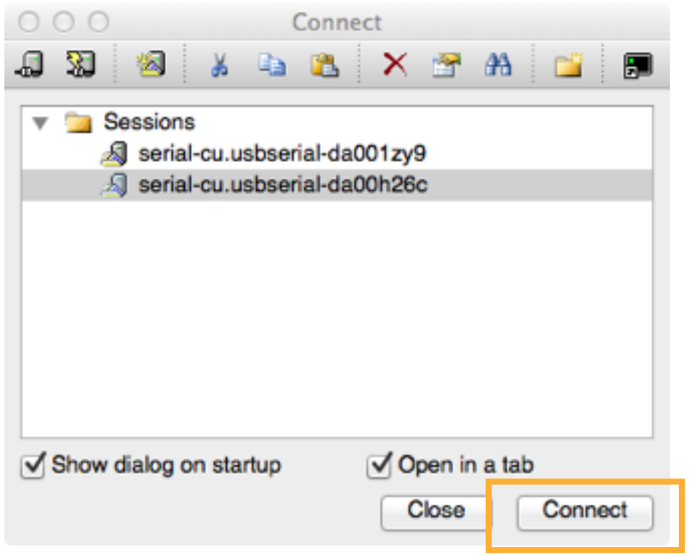
SecureCRT®

SecureCRT for Windows, Mac, and Linux provides rock-solid terminal emulation for computing professionals, raising productivity with advanced session management and a host of ways to save time and streamline repetitive tasks. SecureCRT provides secure remote access, file transfer, and data tunneling for everyone in your organization.

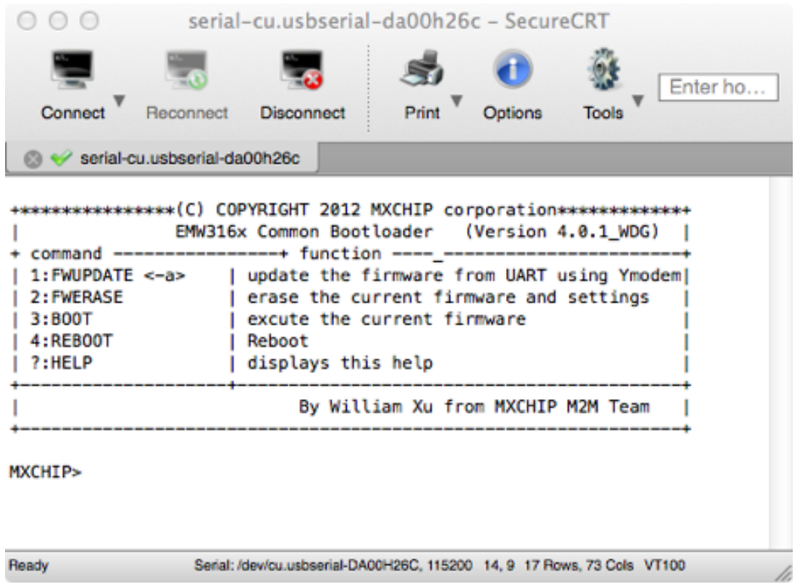


Update using the MXCHIP Bootloader (3)

- Step1: Open SecureCRT and connect to the virtual serial port



- Step2: Set BOOT(SW1) to L. Reset the module. Menu info will be displayed on SecureCRT



Update using the MXCHIP Bootloader (4)

Command list

Command	Shortcut	function
FWUPDATE	1	Erase and update the mxchipWNet™ Firmware
FWERASE	2	Erase the mxchipWNet™ Firmware
BOOT	3	Execute the mxchipWNet™ Firmware *
REBOOT	4	Software reset the module
DRIVERUPDATE		Erase and update the RF driver
BOOTUPDATE		Erase and update the bootloader

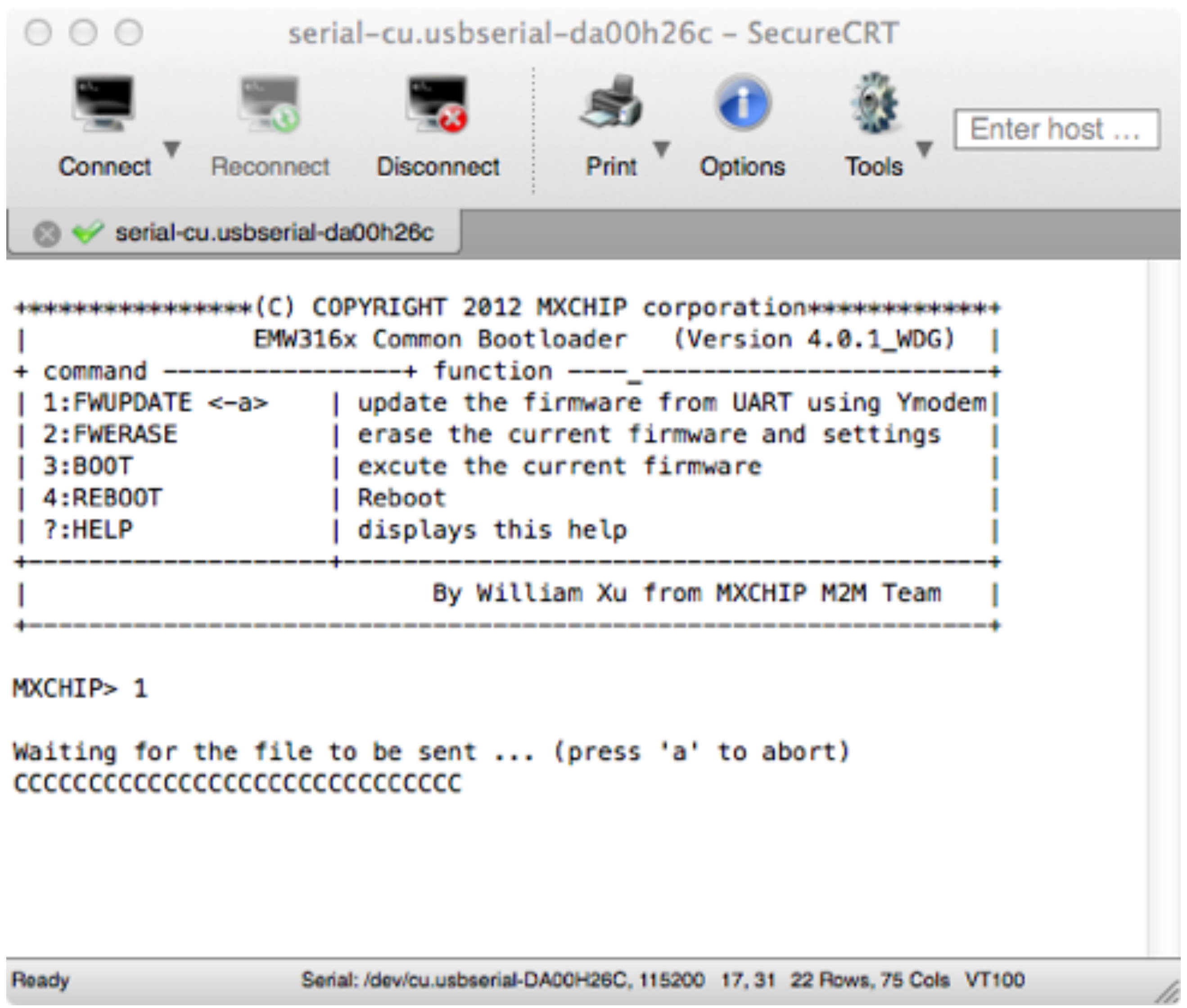
* This command is not supported on EMW316x

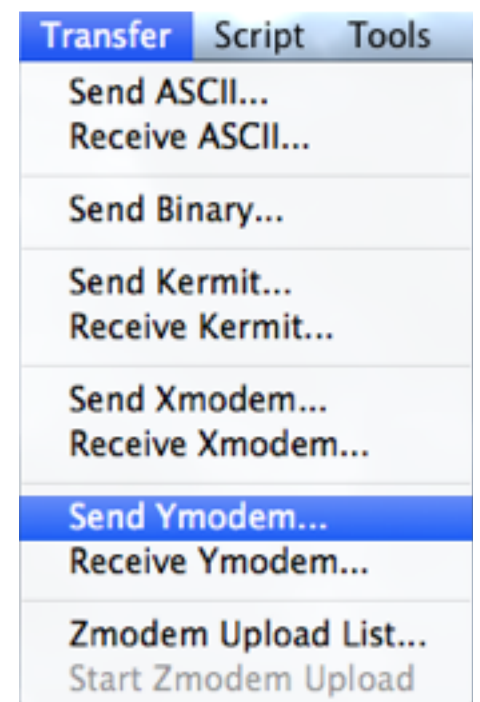
Update using the MXCHIP Bootloader (5)

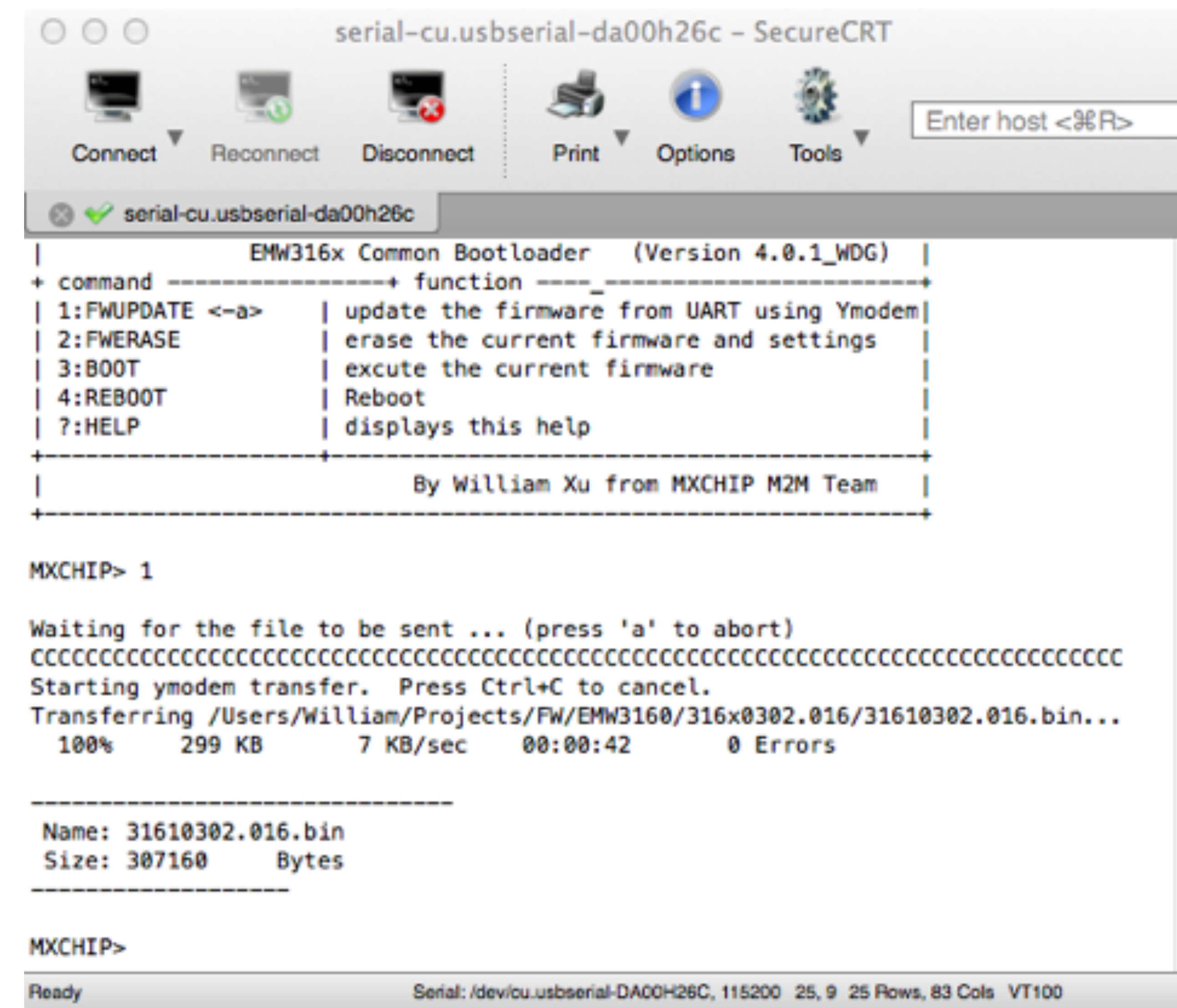
- Step4: Enter command: “FWUPDATE” or “1”

  Use DRIVERUPDATE command to update RF driver
  Use BOOTUPDATE command to update bootloader

- Step5: Send the new firmware (binary file) using Ymodem
- Step6: Set BOOT(SW1) to H. Reset the module and run the new firmware.







- Wait the file transmission complete, the firmware update is successful

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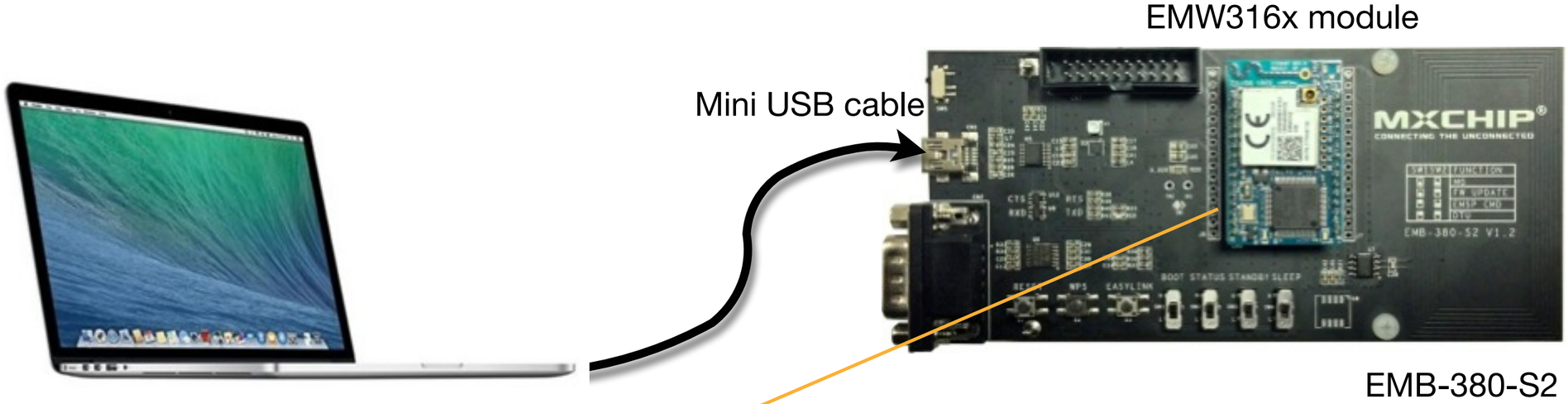
Update using the ST ISP Programmer(1)

Hardware Connection



ST boot pin: 27

ST BOOT PIN	Operation mode
L	Main Flash memory, normal mode
H	System memory, ISP function enabled

Update using the ST ISP Programmer(2)

Software Preparation

- USB driver: http://www.ftdichip.com/Drivers/VCP.htm
- A virtual serial port will appear after the driver is installed

Processor Architecture			
Operating System	**Release Date**	**x86 (32-bit)**	**x64 (64-bit)**
Windows 8.1	2013-10-21	2.08.30	2.08.30
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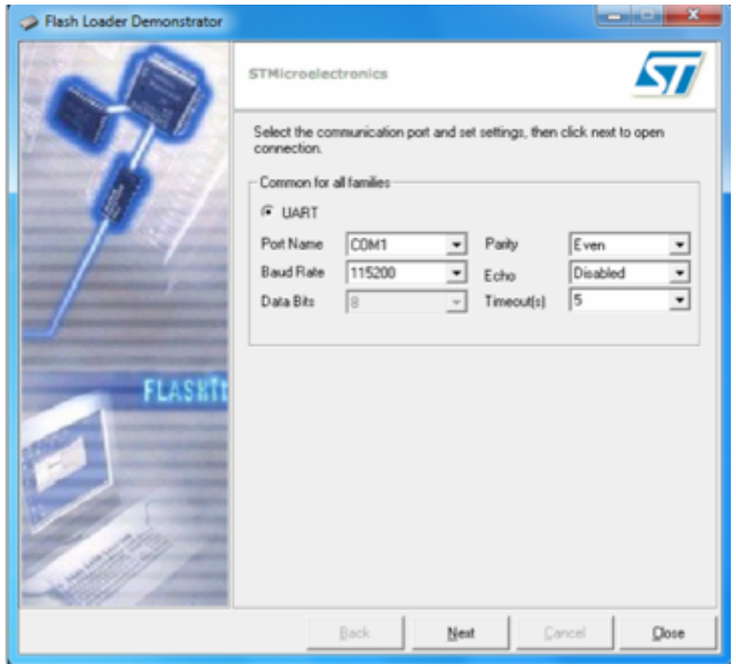
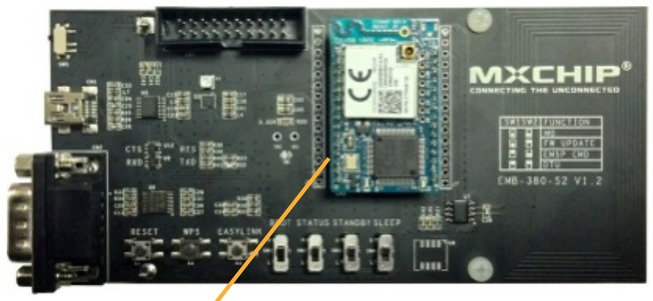
- ISP programmer from ST micro

  Download STM32 and STM8 Flash loader demonstrator

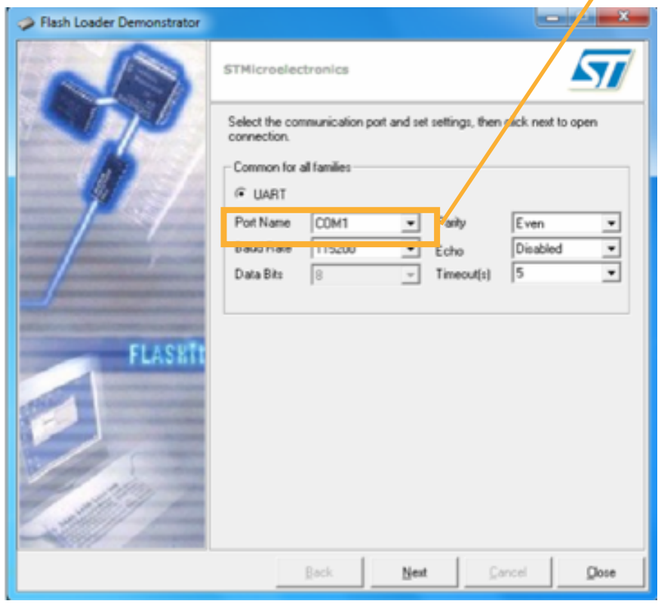


Update using the ST ISP Programmer(3)

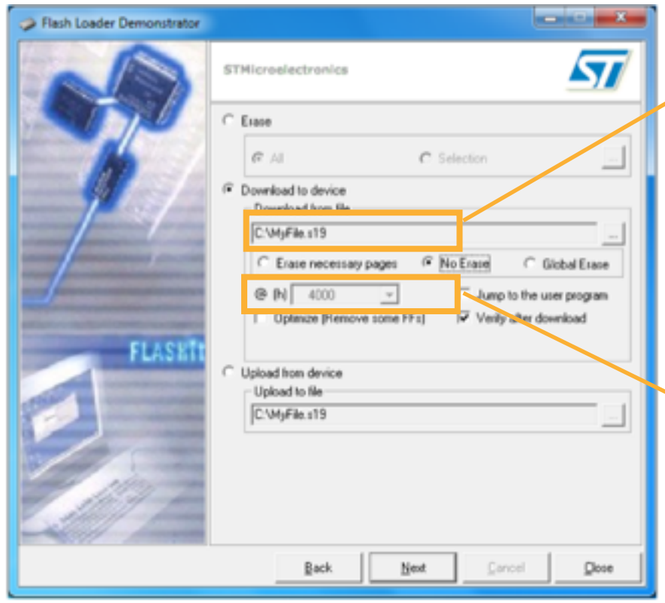
- Step1: Set ST BOOT PIN to H. Reset the module.



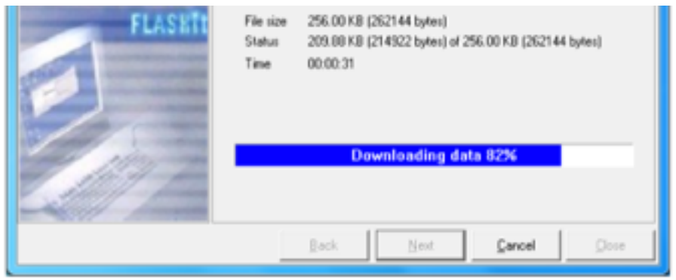
- Step2: Open [STM32 and STM8 Flash loader demonstrator]



- Step3: Press “Next”->“Next”->“Next”…



- Step4: Wait and done!



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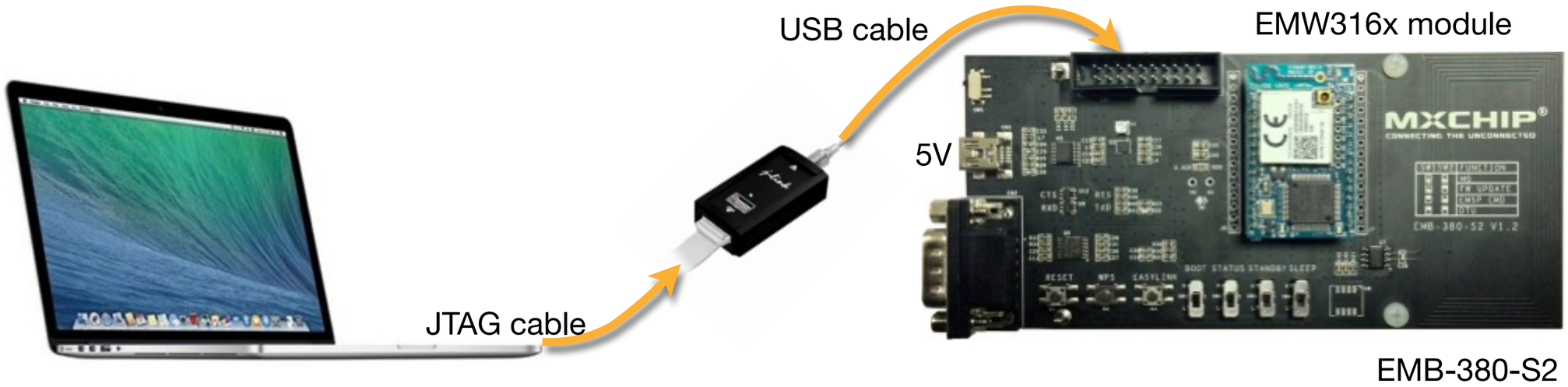
Update using J-link and J-Flash (1)

Hardware Connection

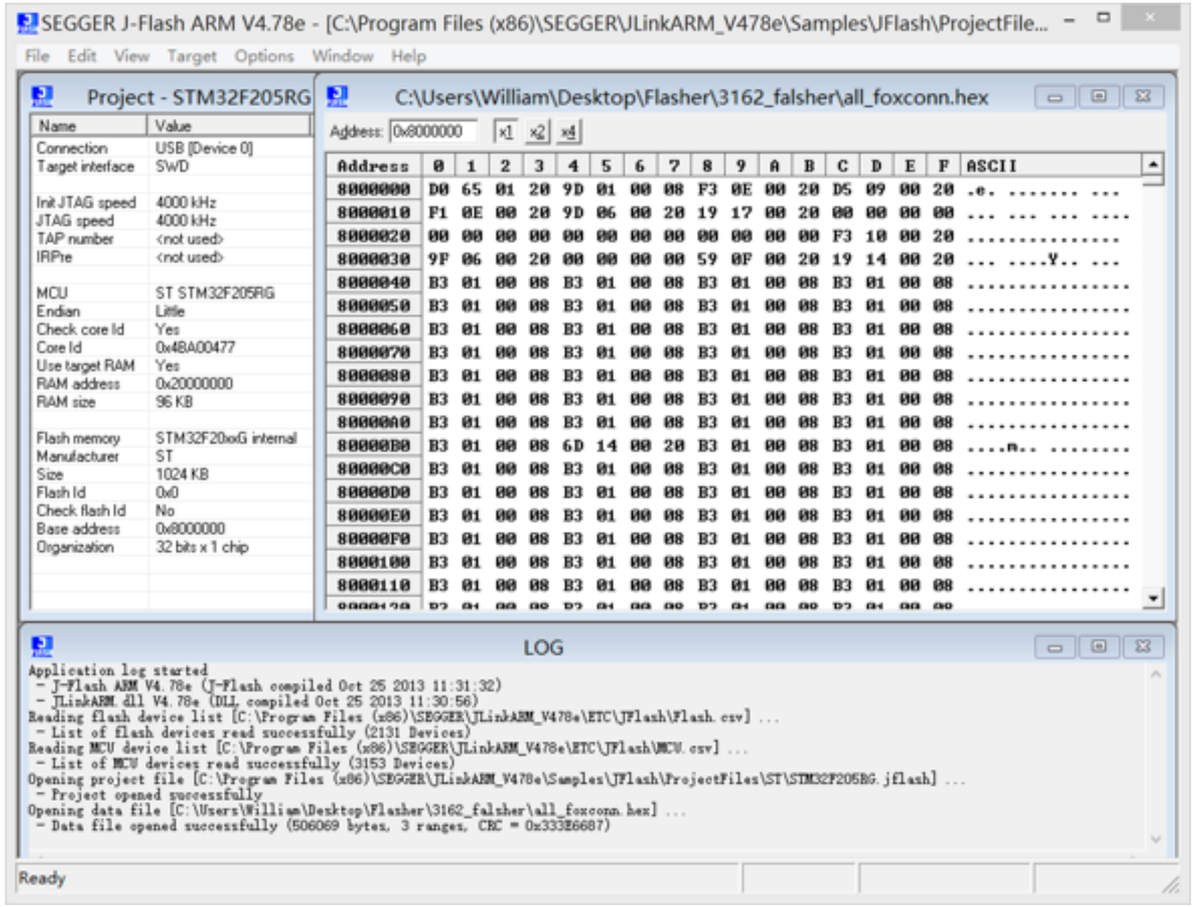


EMB-380-S2

Update using J-link and J-Flash (2)

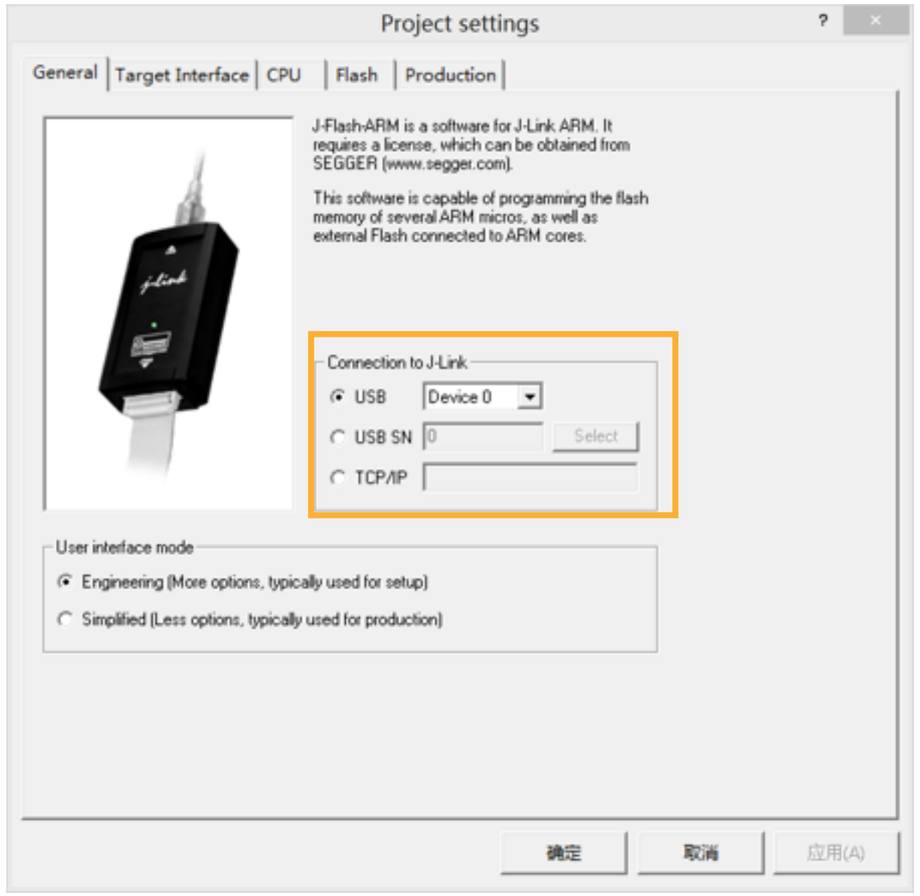
Software Preparation

- Download J-link driver and J-Flash programmer http://www.segger.com/jflash.html

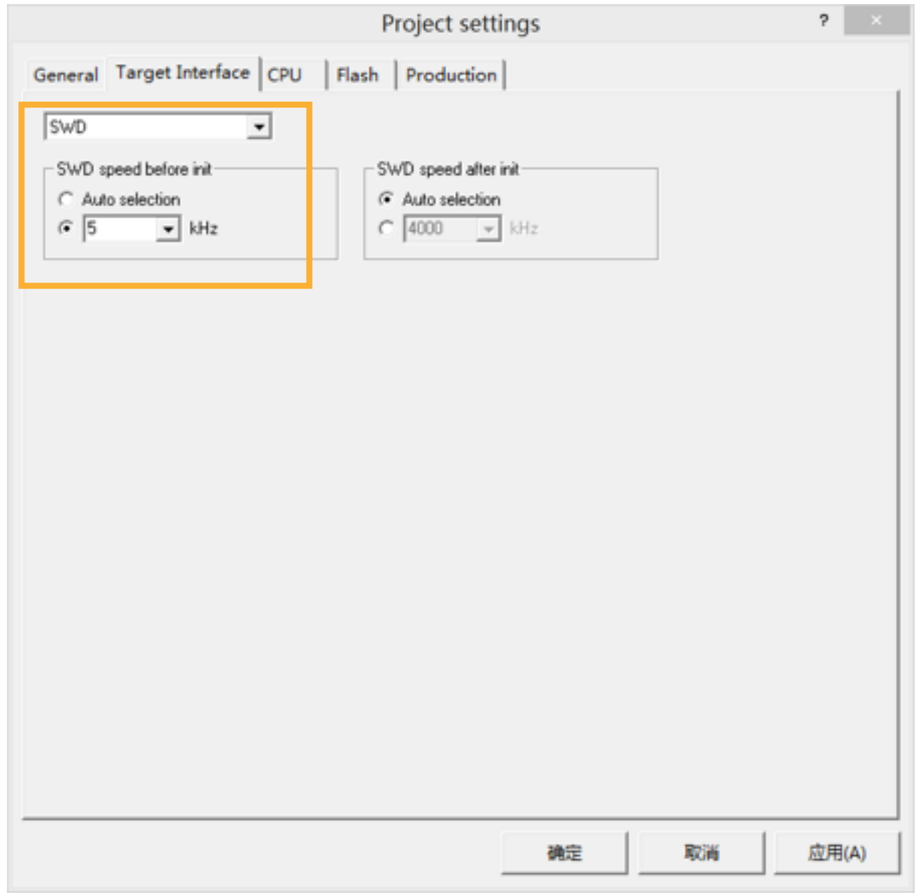


Update using J-link and J-Flash (3)

- Step 1: Open J-Flash software, Options->Project settings, select correct USB port for J-link

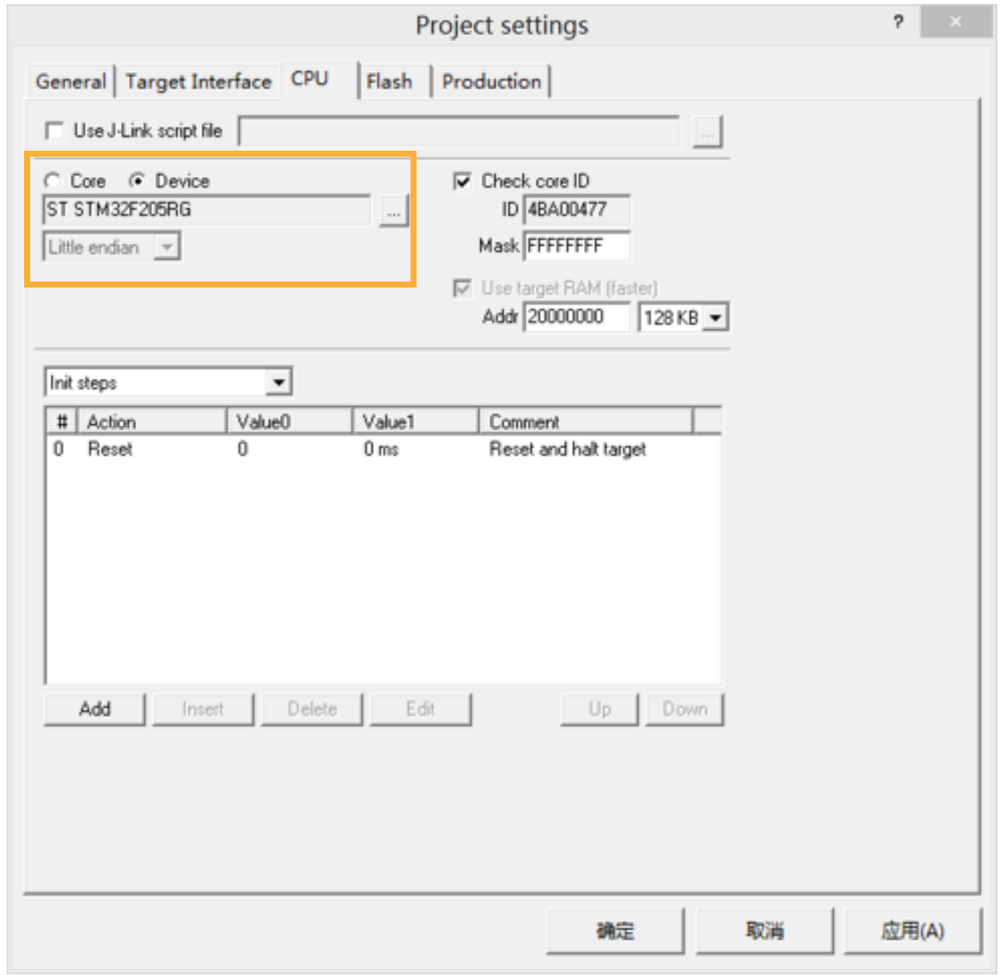


- Step 2: Select SWD interface on Target Interface tag

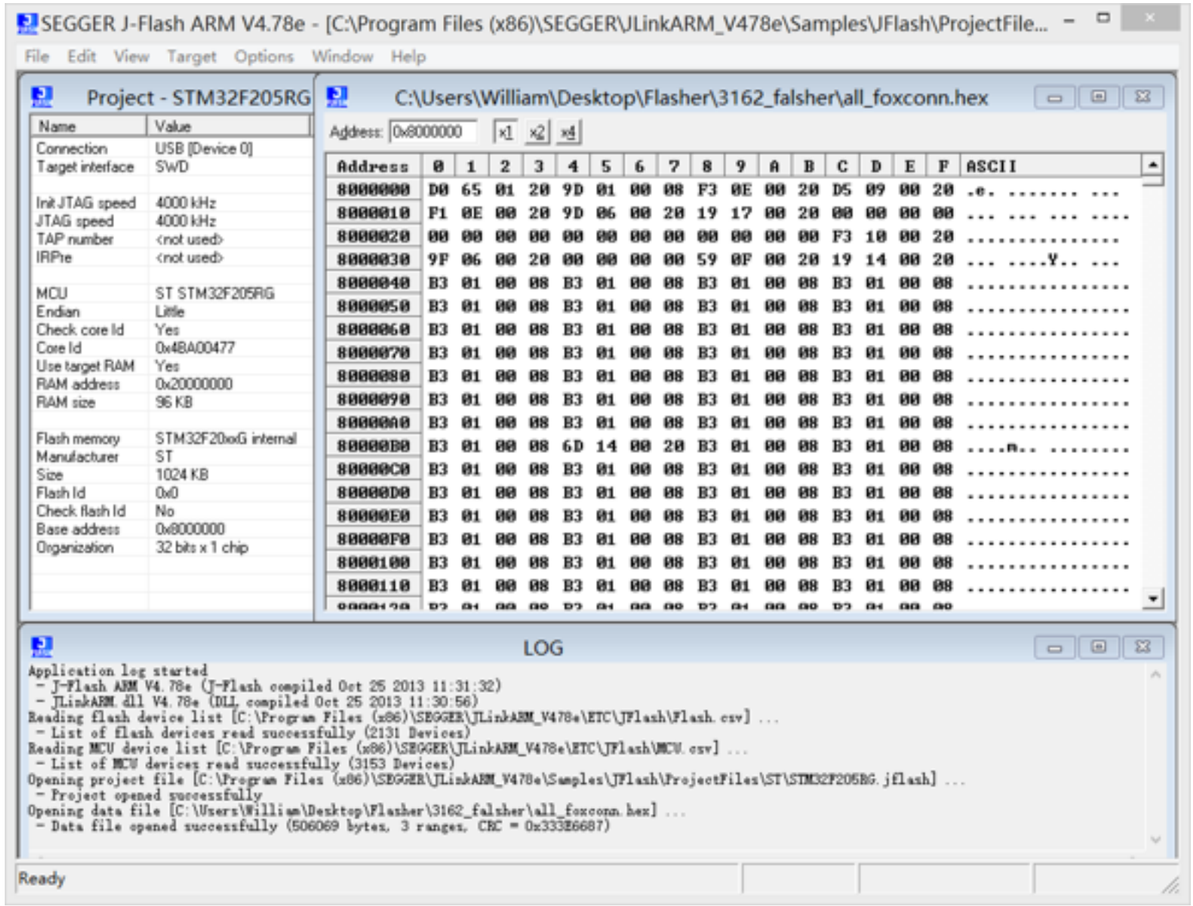


Update using J-link and J-Flash (3)

- Step 3: Select Device: ST STM32F205RG



- Step 4: File->Open data file, open the firmware file
- Step 5: Target->Program, wait and done!



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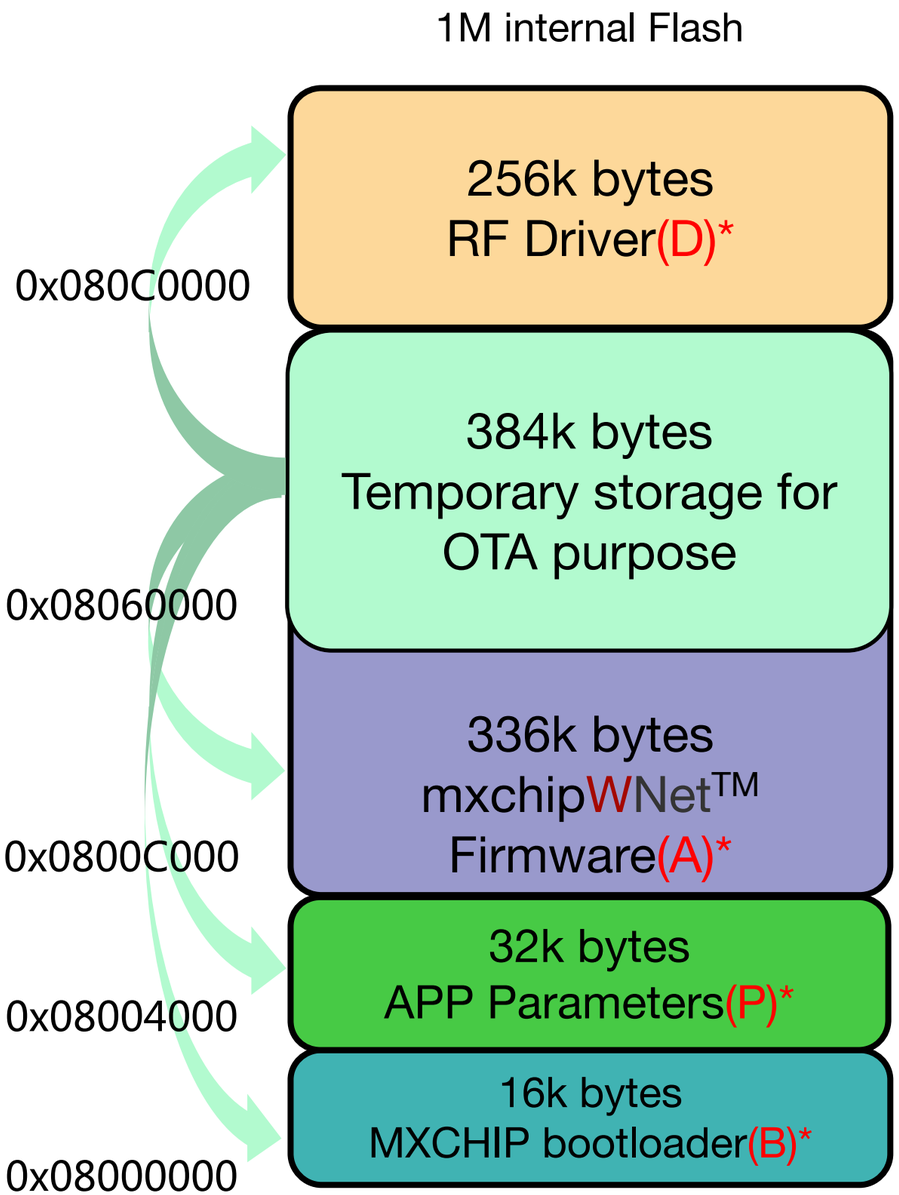
EMW316x Flash Memory Map



* Content Type

Start	End	Type	Size (bytes)	Content
0x08000000	0x08003FFF	B	16k	Bootloader
0x08004000	0x0800BFFF	P	32k	OTA info，user para.
0x0800C000	0x08060000	A	336k	User application
0x08060000	0x080C0000	–	384k	OTA temporary storage
0x080C0000	0x080FFFFF	D	256k	RF Driver

OTA Procedure

OTA steps

1. Download update data to OTA storage (User)
2. Write OTA info to 0x08004000 (User)
3. Reboot (User)
4. Bootloader update the target flash memory using update data (Bootloader)
5. Bootloader clear the update data and OTA info (Bootloader)
6. Start the application (Bootloader)

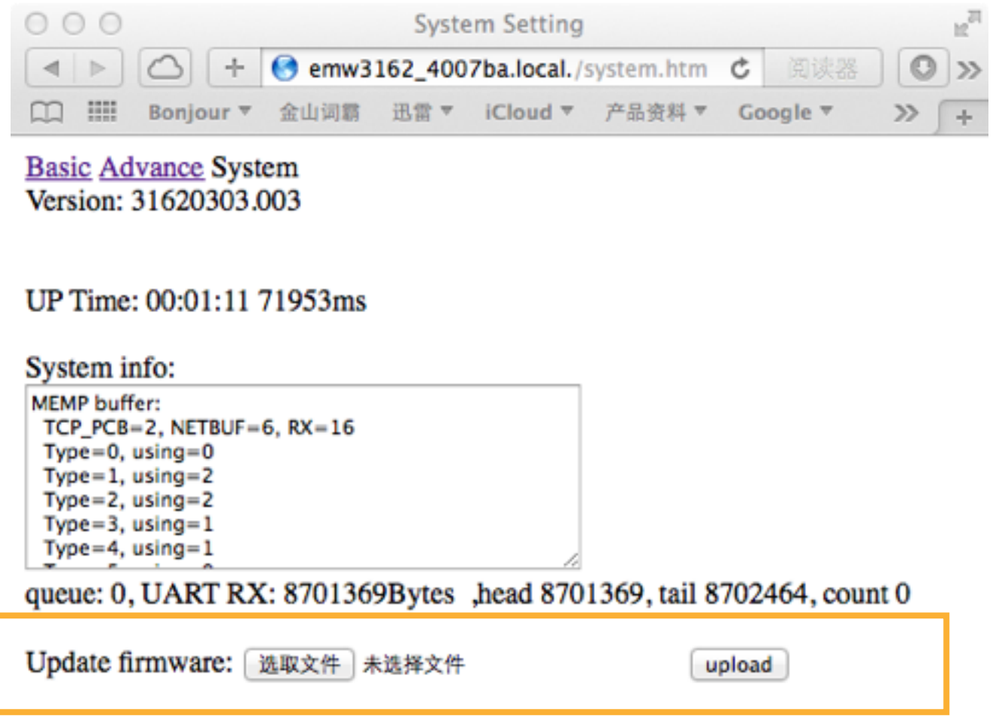
OTA info @ 0x08004000

Name	Data Type	Data Length	Content
START ADDRESS	Word	1	OTA data storage address (should be 0x08060000 only now)
LENGTH	Word	1	OTA data length
VERSION	Byte	8	Version（Not used）
TYPE	Byte	1	Target content type (’B’,’P’,’A’,’D’)
UPDATE	Byte	1	Update tag(‘U’)
REVERSED	Byte	6	Reserved

Target content type: Which data block should be updated by the new data in OTA data storage

Update using the build-in web server

- Use HTTP protocol to upload the new firmware to the OTA storage in the flash
- Build-in Web server function is deployed on these firmware or demo applications:
  - ✓ mxchipWNet™ DTU firmware
  - ✓ mxchipWNet™ Basic library demos: Web server and OTA
  - ✓ mxchipWNet™ Professional library demos: TCP IP Stack



THE END

Make wireless connections
Simple

Thank you!