

**Application
Note**

Update Firmware on EMW3280/EMW316x

Embedded Wi-Fi module

3.0

Date : 2013-05-30

Application Note

Overview

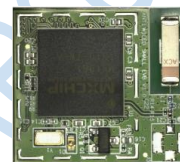
EMW3280/EMW316x Wi-Fi modules are designed for embedded applications. They have a Cortex-M3 core MCU: STM32F2x5RG with rich peripherals, 1M bytes flash and 128k bytes SRAM. Users can build their own embedded Wi-Fi applications based on **mxchipWNet™** library which manage all of the Wi-Fi MAC and TCP/IP stack processing. We also provide several **mxchipWNet™** firmware to meet typical applications: wireless UART, wireless audio, wireless sensor etc.

This document describe the detailed steps to change the firmware running on these modules.

EMW3280



EMW3161



EMW3162



Applications

- Building Automation / Access Control
- Smart home appliances
- Medical/Health Care
- Industrial Automation Systems
- Point Of Sale system (POS)
- Auto electronics
- Communicate with smart phones and tablets

Module	-	Antenna	
EMW3280	-	P	On-board PCB antenna
	-	E	IPEX connector
EMW3160	-	C	Chip antenna
EMW3161	-	E	IPEX connector
EMW3162	-		

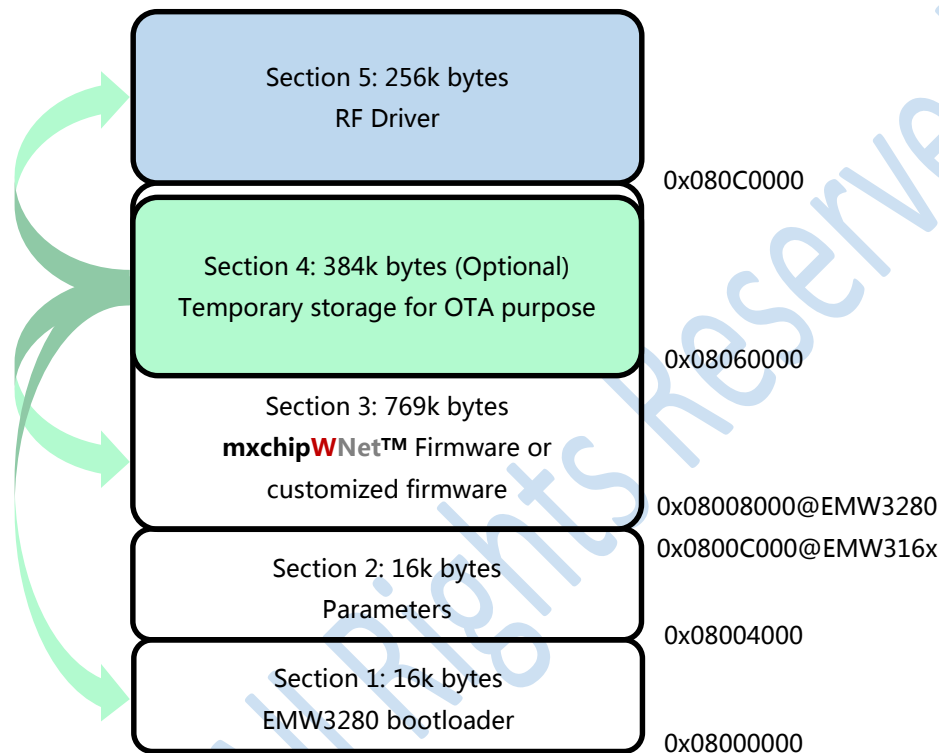
Contents

1	INTRODUCTION	3
2	UPDATE BY UART (SERIAL PORT)	4
2.1	Hardware connection	4
2.1.1	Ground the BOOT pin before power on	4
2.1.2	Connect the serial port	5
2.2	Send Firmware by Ymodem protocol	6
3	UPDATE BY A BUILD-IN WEB SERVER	8
4	SALES INFORMATION	9
5	TECHNICAL SUPPORT	9

1 Introduction

EMW3280/316x modules have Cortex-M3 MCU with rich peripherals, users can build their own embedded Wi-Fi applications based on **mxchipWNet™** library which manage all of the Wi-Fi MAC and TCP/IP stack processing. MXCHIP also provide **mxchipWNet™** firmware to meet typical applications: wireless UART, wireless audio, wireless sensor etc.

The firmware is build up by five sections:



Sector 1: Bootloader

The bootloader is the first executed part after module is powered on. It detect the BOOT pin and Status pin to determine the target operation mode. If this part is erased, the only way to reprogram is using a JTAG programming tool.

Sector 2: Parameters

It's a small size memory and is used to store parameters from **mxchipWNet™** firmware and OTA options, it can be modified freely when using a customized firmware. It is no need to program this part because the application in part 3 initialize it.

Sector 3: **mxchipWNet™** firmware or customized firmware

This part contains the main application. New functions can be added by updating module' s firmware, and bugs would also be fixed. This article will mainly discuss the operation about how to update this section.

Sector 4: Temporary storage for OTA purpose (included in section 4, optional)

It is a child area of the section 3. OTA data is temporarily stored here. When OTA is performed, bootloader will use this part to replace other flash parts. Any data in this part will be erased by bootloader if OTA operation is successful or no OTA function is pending. If you want to use this part store our application, you should disable or modify the OTA function in bootloader (section 1).

Sector 5: RF driver

This part contains RF driver and should not be modified in any circumstances. Content of this section is released by MXCHIP as “driver.bin” . Reprogram this part with this file if it is erased by accident.

2 Update by UART (Serial port)

Sector 1, 3, 5 can be reprogramed using a serial port if bootloader (Sector 1) exists in the flash.

But it should be noted that

- ★ It is dangerous to reprogram the bootloader (Part 1), a failed operation may damage the module. MXCHIP do not assume the losses caused by this operation.
- ★ EMW3280 has compatibility issue existed in the bootloader and the **mxchipWNet™** firmware in section 3. Firmware cannot work on the wrong bootloader. Table 1 shows the detail.

	Bootloader	mxchipWNet™ firmware
Compatible 1	EMW 3280Bootloader v4.x	020602xx, 02060301.xxx
Compatible 2	EMW 3280Bootloader v5.x	02060302.xxx, Custom firmware

2.1 Hardware connection

2.1.1 Ground the BOOT pin before power on

EMW3280/EMW316x enter different working mode by detecting the voltage on BOOT pin and STATUS pin when powered on or reset.

Figure 1 Boot pin and Status pin on EMW3280, EMW3160, EMW3162

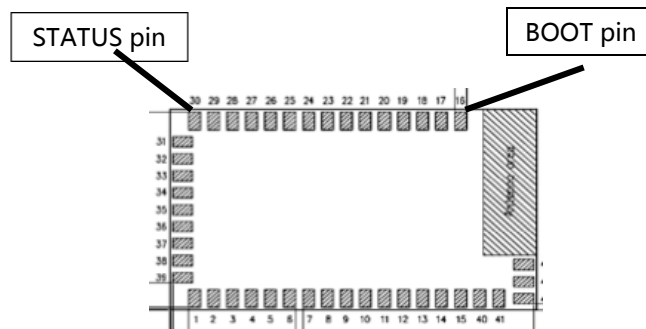


Figure 2 Boot pin and Status pin on EMW3161

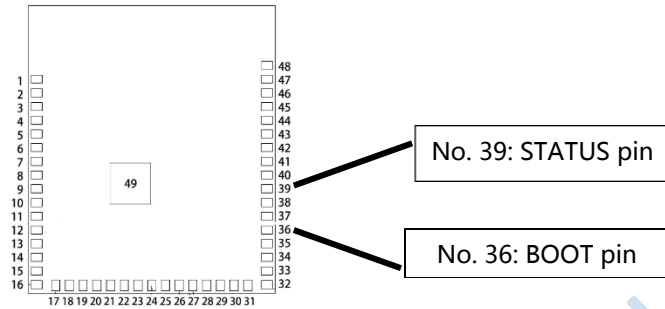


Table 1 Working modes

BOOT	STATUS	Working mode
0	0	Test mode
0	1	Firmware update mode
1	X	Boot the application in Part 3

We need to enter the firmware update mode, so ground the BOOT bin and pull up the STATUS pin. If you are using an EMB-380-S test board, set the switchers as follow.

Figure 3 EMB-380-S switchers

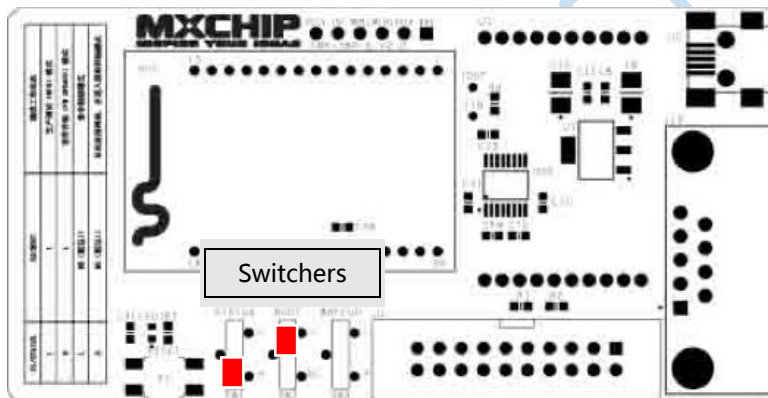
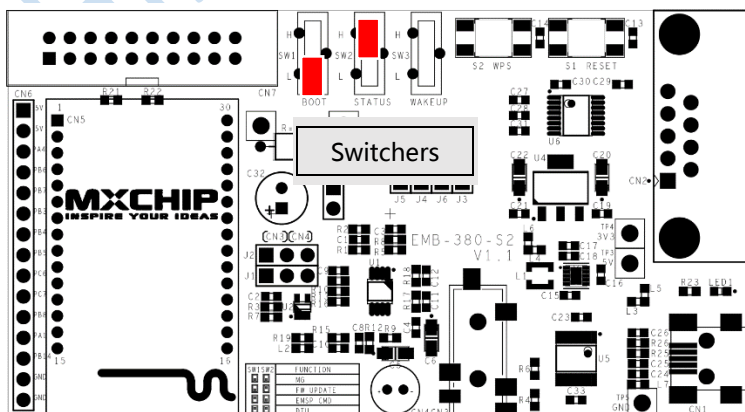


Figure 4 EMB-380-S2 switchers



2.1.2 Connect the serial port

Connect EMW3280 to PC using a serial cable.



An USB-serial converter is installed on EMW-380-S2 test board. It's very easy to connect the test board to PC via a mini USB cable. Set the jump J3, J4, J5, J6 to USB side and download the USB driver from <http://www.ftdichip.com/Drivers/VCP.htm>

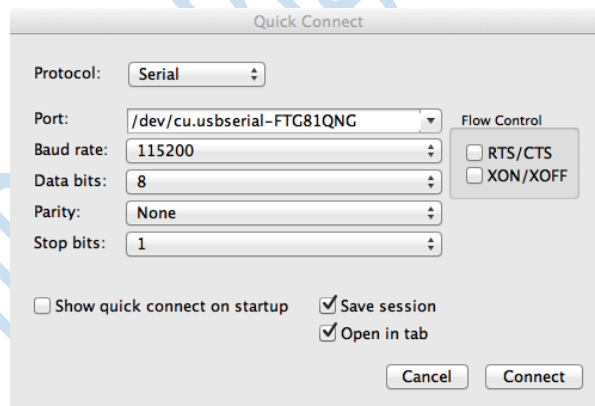
2.2 Send Firmware by Ymodem protocol

Use a terminal software that support serial interface. Windows XP has a build-in software: "Hyper Terminal", and if you are using Windows vista/7/8 or MAC, "SecureCRT" is suggested.

We use "SecureCRT v6.7.3 MAC version" to demonstrate our processing.

1. Open "SecureCRT", and establish a serial connection to module with the settings in figure 3. Port is different depends on the actually serial port.

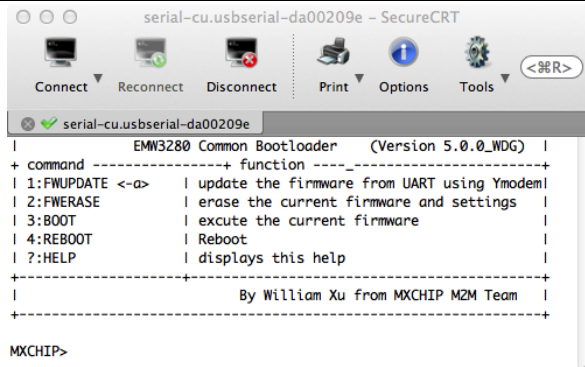
Figure 5 Serial settings on SceureCRT



Baud rate: 115200, Data bits: 8, Parity: None, Stop bits: 1, No flow control

2. Power on or reset your module. The red led should be on, and the green led may flash 3 times every 5 seconds. Besides, you can see outputs on the SecureCRT terminal.

Figure 4 Serial output in firmware update mode



If you cannot see above phenomenon, please recheck the hardware connection in chapter 2.1.

At this step, we can type in the following commands to serial terminal.

Table 2: Command list

Command	Short cut	Description
FWUPDATE	1	Update the memory in PART 3.
FWERASE	2	Erase the memory in PART 3.
BOOT	3	Execute the application in PART 3.
REBOOT	4	Reboot the module.
HELP	?	Display the help information.
DRIVERIPDATE	-	Update the memory in section 5.
BOOTUPDATE	-	Update the memory in section 1.

- According to table 2, if we need to update the module's main application in memory section 3, just type '1' and 'return' key. Then you can see the outputs on the terminal, the module is ready to receive the new firmware. Return to command prompt by type 'a'.

Figure 6 Ready to receive the new firmware

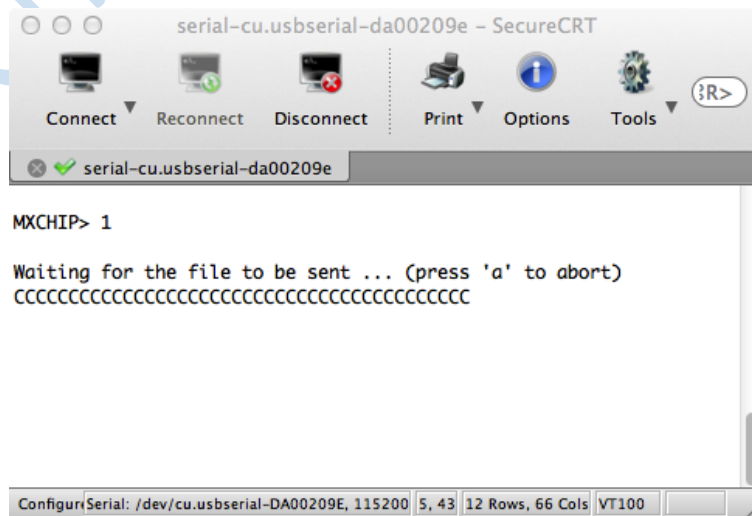
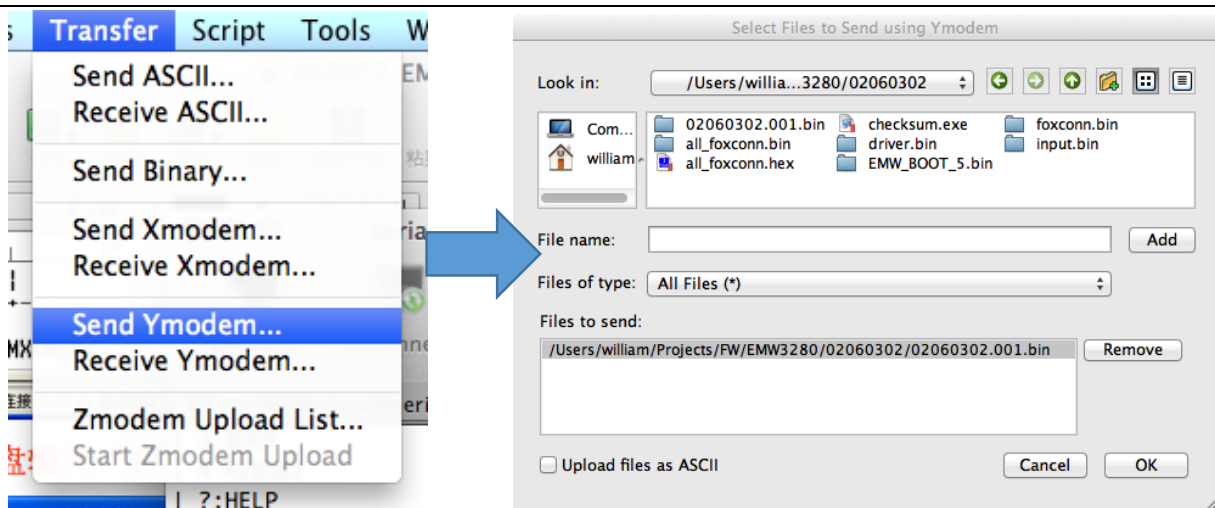
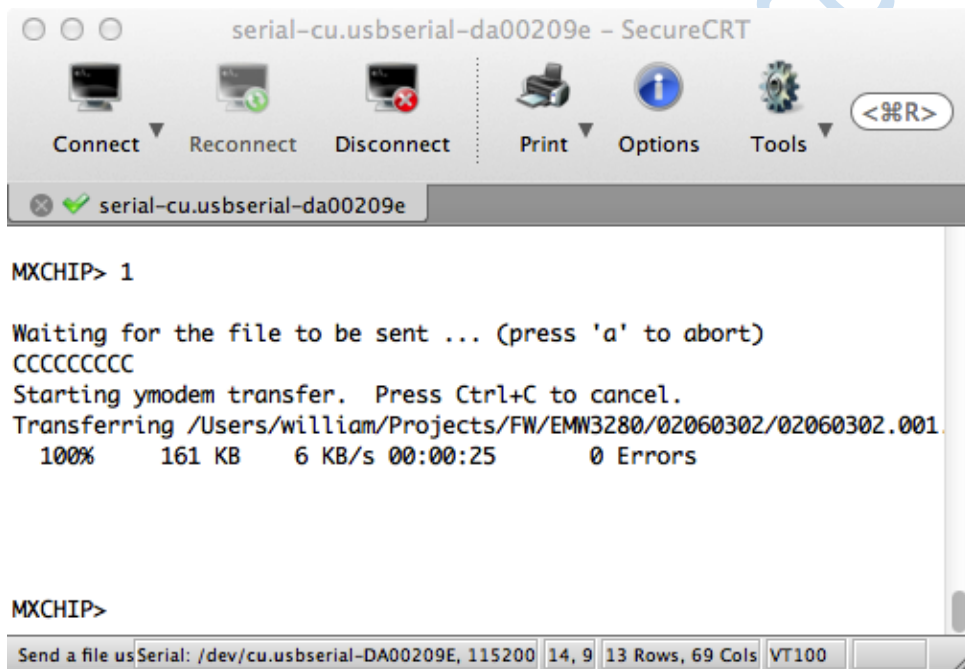


Figure 7 Send your new firmware by Ymodem protocol.



4. Wait the updating complete.

Figure 8 Update successful!



Note: Use other commands in table 2 to update the bootloader in section 1 or RF driver in section 5 if needed.

3 Update by a build-in web server

This method can only update the firmware in memory section 3, and only existed on the module running an **mxchipWNet™** firmware.

You can login to the module's build-in html page on your web browser. Use bonjour service to find module's IP address, or restore module's settings to default by press down the WPS/Default pin for 5 seconds. The default IP address is 192.168.1.1.

Upload the new firmware on the system page, module may reboot after the upload is successful. Wait 5 seconds, the module would execute the new firmware.



4 Sales Information

If you need to buy this product, please call MXCHIP during the working hours.
(Monday ~ Friday A.M.9:00~12:00; P.M. 1:00~6:00)

Telephone: +86-21-52655026 / 52655025

Address: Room 811, Tongpu Building, No.1220 Tongpu Road, Shanghai

Post Code: 200333

Email: sales@mxchip.com

5 Technical Support

If you need to get the latest information on this product or our other product information, you can visit: <http://www.mxchip.com/>

If you need to get technical support, please call us during the working hours:

ST ARM technical support

+86 (021)52655026-822 Email: support@mxchip.com

Wireless network technical support

+86 (021)52655026-812 Email: support@mxchip.com

Development tools technical support

+86 (021) 52655026-822 Email: support@mxchip.com