# Updating Your DXM Processor Firmware



## Updating the DXM Processor Firmware

There are two different update procedures, depending on the DXM firmware version of your device.

### Update Your DXM Processor Firmware (Prior to Version 2.0)

To update DXM Processor firmware prior to version 2.0, use the SAM-BA program from MicroChip/Atmel. Following these instructions to update the DXM100 or DXM150 processor firmware.

- 1. Download the SAM-BA software from *http://www.microchip.com/developmenttools/productdetails.aspx?partno=atmel* +sam-ba+in-system+programmer.
- 2. Install the SAM-BA program.
- 3. Set the SAM4 processor board jumper (jumper C, shown below in the "boot load off" position).



- a) Disconnect the DXM Controller from its power supply.
- b) Open the hardware cover.
- c) Using your fingers or tweezers, move the jumper to the "boot load on" position (jumper on the top two pins).
- d) Connect the DXM back to its power supply.
- e) After about 20 seconds, move the jumper back to its original position.
- f) Replace the hardware cover.
- 4. Launch the SAM-BA program. Select the COM port and correct board. Click CONNECT.

SAM-BA 2.16					
Select the connection : \\USBserial Select your board : at91sam4e	COM116 J-Link Interface				
JLink TimeoutMultiplier : 0	- SWD				
🖂 Customize lowlevel					
Connect	Exit				

The SAM-BA program attempts to automatically detect the COM port and the correct device.

5. On the SCRIPTS pull-down menu select ENABLE FLASH ACCESS. Click EXECUTE.

	1sam4e16-ek					- D -×
File Script File H	Help					
at91sam4e16-ek Men	nory Display					
Start Address : 0x200	00000 Refrest	h Display form	nat		F	Applet traces on DBGU
ize in byte(s) : 0x100		C ascii C	8-bit C 16-bit	<ul> <li>32-bit</li> </ul>	P	ntos Appiy
0x20000000	0x0000001	0x00000000	0x0000001	0x008004DB		^
0x20000010	0x00800503	0x008004C3	0x008004CF	0x00800C3D		
0x20000020	0x00800CDF	0x0001C200	0x00080000	0x000021A1		
0x20000030	0x00070000	0x00000000	0x0000000	0x40084000		
0+20000040	0*0000001	0*0000040	0+00000000	0#20000026		
Download / Upload	d File			<b>2</b>	Send File	
Download / Upload	d File			<b>\$</b>	Send File	
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– Download / Upload Send File Name : Receive File Name : Address :	d File	e (For Receive File)	: 0x1000 byte	<b>2</b>	Send File Receive Fil Compare sent file wi	e th memory
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-Download / Upload Send File Name : Receive File Name : Address : Scripts Enable Flash access	d File	e (For Receive File)	Dx1000 byte     Execute		Send File Receive Fil Compare sent file wi	ie ith memory
- Download / Upload Send File Name : Receive File Name : Address : Scripts Enable Flash access In-Da_2.10 1 1% Ff .oading applet app demory Size : 0x1	d File :	e (For Receive File) bin at address 0:	: (0x1000 byte Execute x20000800	(s)	Send File Receive Fil Compare sent file wi	ie
- Download / Upload Send File Name : Address : Scripts 	d File : : : : : : : : : : : : :	:e (For Receive File)	: 0x1000 byte	(s)	Send File Receive Fil Compare sent file wi	ie
Download / Upload     Send File Name :         Receive File Name :         Address :         Scripts      Thr0a_2.10) 1 % Fil     Undoing applet app     Memory Size : 0.0.     Buffer address : 0     Buffer sizes size: 0.01000	d File : : : : : : : : : : : : :	e (For Receive File)	: (0x1000 byte 	6	Send File Receive Fil Compare sent file wi	le
Download / Uploat     Send File Name :         Receive File Name :         Address :         Scripts      Finble Fissin access      Minroy Size : 0xh     Buffer size: 0xh     Buffer size: 0xh     OApplet initialization     Applet initialization	d File : : : : : : : : : : : : :	e (For Receive File)	: [0x1000 byte ▼ Execute x20000800	6	Send File Receive Fil Compare sent file wi	ie the memory

- In the SCRIPTS pull-down menu, select BOOT FROM FLASH (GPNVM1). Click EXECUTE. Click EXECUTE again if the message indicates it failed.
- 7. In the Flash tab, click on the folder icon for the Send File Name field. Select the boot load file (must be a \*.bin file) and click SEND FILE.

SAM-BA 2.16 - at91sam4e16-ek		
File Script File Help		
at91sam4e16-ek Memory Display		
Start Address - 0x20000000 Refre	b Display format	Applet traces on DBGU
Size in byte(s) : 0x100	C ascii C 8-bit C 16-bit ⊙ 32-bit	infos  Apply
0x20000000 0x00000001	0x00000000 0x0000001 0x008004	DB
0x20000010 0x00800503	0x008004C3 0x008004CF 0x00800C	3D
0x20000020 0x00800CDF	0x0001C200 0x00080000 0x000021	Al
0x20000030 0x00070000	0x00000000 0x0000000 0x400840	00
4 0-0000000	0**************************************	
Receive File Name :		Receive File
Address : 0x400000 S	ize (For Receive File) : 0x1000 byte(s)	Compare sent file with memory
Scripts		
Boot from Flash (GPNVM1)	Execute	
r Memory Size : 0x100000 bytes		
I- Buffer size: 0x10000 bytes I- Applet initialization done		
sam-ba_2.16) 1 % FLASH::ScriptGPN F GPNVM1 set sam-ba_2.16) 1 %	MV 2	

The load process takes a few seconds.

- 8. After the load is complete, the program asks if you want to lock the flash region. Click NO.
- 9. Close the SAM-BA bootloader program.
- 10. Cycle the power to the DXM Controller. The new code should now be running and the LEDs should be on.

#### Updating Your DXM Processor Firmware (Version 2 or Later)

DXMs with processor firmware version 2.0 or later have a built-in boot loader program to update the firmware. Use the DXM Configuration Tool version 3 or later, the Banner Connected Data Solutions webserver, or manually write the files on the SD card to update the firmware.

The new firmware file loads into the **BOOT** directory of the SD card on the DXM. The DXM Configuration Tool or Banner Connected Data Solutions website handles the reprogramming process automatically. During the programming process, the internal LEDs on the processor board indicate the status of the programming.

Update Process Overview	ate Process Overview				
Reprogramming Step	Approximate time required	Description			
Loading new firmware file (*.HEX)	DXM Configuration Tool: 2 minutes over Ethernet or 15 minutes over USB	Send the new firmware image to the DXM. After the new image is on the device, the controller resets.			
	Banner Connected Data Solutions: 2 minutes over Ethernet or 5 minutes over Cellular	LED3 is red during the loading process.			
Verify the contents of the new firmware file	1 minute	When the DXM finds a file that should be installed, LED4 (amber) flashes at about a 1 second rate while the contents of the file are validated.			
New firmware file is valid		After validation successfully completes, LED4 is on (amber).			
New firmware file is being loaded	2 minutes; do not remove power to the DXM during the programming process.	LED3 (red) blinks approximately once per second. LED3 continues to blink during the application programming process.			
Finished		After programming has completed, the DXM resets and begins running the new firmware			

The firmware file names follow an 8.3 filename convention. The first 5 characters are the firmware part number in hexadecimal; the last 3 characters of the part number are the major/minor version number. For example, if 30FA9052.hex is the firmware programming file, 200617 decimal (30FA9 hex) is the firmware part number and 0.5.2 (0502) is the decoded version number.

#### Update Your DXM Processor Firmware Using the DXM Configuration Tool

To update your processor firmware (version 2.0 or later) using the DXM Configuration Tool, follow these instructions.

- Using the DXM Configuration Tool version 3 or later, connect to the DXM via USB<sup>1</sup> or Ethernet.
   File loads to the DXM will take about 15 minutes using USB or approximately 2 minutes using Ethernet.
- On the DXM Configuration Tool, go to Settings > General > Device Information to verify the current firmware version.
   You must load a different version with the same firmware number for the boot loader to operate. Download firmware files from the Banner website.

Get device info	mation				
Process	or information		ю	board information	
Serial number	000001	Serial number	000318	EEPROM number	177276
Model number	Sxi4eModule	Model number	000000	EEPROM version	0.1C
Firmware number	fw182124	Firmware number	177275		
Version	1.0.5	Firmware version	3.5H		

3. Under Settings > Reprogram, click Select upgrade file to select the firmware file to program.

After the file load is completed, the DXM restarts and loads the new firmware file. It takes about 2 minutes to complete the programming process. The device reboots when finished. Verify the firmware has been updated, under **Settings** > **General** > **Device Information**.

#### Update Your Processor Firmware Using the Banner Connected Data Solutions Website

To update your processor firmware (version 2.0 or later) using the DXM website, follow these instructions.

To use the website to update the firmware file, first configure the DXM to push data to the website.

1. Go to **Dashboard** > **Sites** and click + to verify the current firmware part number and version on the DXM.

O AUpdate >	FinalTestCell b77764	id-645d-43cf-9d17-7b74764b0988	4d 23h 24m	Clear	Clear	None
Site Configuration: Authentication: OFF Auto Configure: OFF	Xml Configuration: File Name: FinsTfestOckxml File Updated: 1007/2016 09:02 (241d Sh 26 Push Method: Cellular Push Interval: 00:0100 Pol Interval: 00:0100 Register Estimate per Cay: 432	Site Info: Last Push: 4d 25h 26m M Last OPS: None GPS Updated: 4d 23h 26m Pending Updates: None Registers in Last Day: 0	Initial Push: Last Reboot 05/31/2017 15 Device Firmurae: v2.00.00 Model: 177271 Serai: 8/32919 Mac: M.00.23.d9.00.c2.06 Cell Number: – Cell NED:	5.03 (4d 23h 26m) w200617	Alarm Info: Connectivity: None MAC: None Registers: 0 Geofence: Clear	

Data collected from the DXM is displayed.

- 2. From the main **Dashboard** > **Sites** screen, click on **Update**. A popup box appears.
- 3. Set the Communications Type to Push Reply, and set the Update Type to Firmware file.
- 4. Choose the appropriate Upload File (\*.HEX) and click Queue. Click Close.
- At the next scheduled push interval, the DXM retrieves the new firmware file. The new firmware file must be the same part number of firmware that is currently in the DXM.

<sup>&</sup>lt;sup>1</sup> While the file download is in process over a USB connection, do not use other applications on the PC. After the DXM reboots for a firmware update, the USB port may be unresponsive. Clear the connection by disconnecting the USB cable and restarting the DXM Configuration Tool software.

#### Update Your Processor Firmware Manually

To manually update your processor firmware (version 2.0 or later) using SD card, follow these instructions. The firmware file can manually be put on the SD card in the BOOT directory (must have version 2.0 or later on the DXM).

- 1. Disconnect the DXM from its power supply.
- 2. Remove the micro SD card from the DXM.



- a) Open the cover housing to the DXM.
- b) Use your fingernail to slide the top metal portion of SD card holder.
- c) The metal cover hinges upward, allowing access to the remove the SD card.
- d) Press down on the SD cover and slide back into position to close the SD card holder.
- 3. Insert the micro SD card into an SD card reader to access the data from a PC.
- 4. Load the new firmware file (\*.hex) into the BOOT directory of the micro SD card.
- 5. Re-insert the micro SD card into the DXM by sliding the card into the holder.
- 6. Reconnect the DXM to its power supply.
- The automatic boot process should begin. If the boot process does not begin, verify the firmware file is correct and it is a different version than what is currently installed on the device.

