Application Note 105

JANUS REMOTE

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400AP Application Note Uploading Firmware Images to 400AP NAND Flash Models

Table of Contents

Overview	. 2
Requirements	.2
Firmware Images	.2
Terminal Emulator	. 3
RomBOOT Mode:	.4
SAM-BA	1-5
Uploading Firmware Images to Flash	. 6
Uploading Bootstrap Image	ò-7
Uploading U-Boot Image	3-9
Uploading Kernel Image	11
Uploading Filesystem Image	13
Uploading Full Production Image	15
U-Boot Environmental Variables	16

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Overview

This document describes the process of uploading the required firmware images to NAND flash of the 400AP. These instructions should be followed if you are uploading new firmware into the 400AP.

Requirements:

Linux Development PC:

Instructions contained in this application note are based on the Ubuntu distribution of Linux. If you are using another distribution of Linux the instructions might need to be altered to match the Linux distribution you are using.

Software Applications:

The following applications are used in this application note. These applications run on the Development PC.

Atmel's SAM-BA

minicom Terminal Emulator

400AP (NAND flash models):

The following serial numbers use NAND flash as non-volatile memory.

Serial numbers are listed on product label.

ARXXXXX DEMO-??-ARXXXXX ??-ARXXXXX

X = Numeric value (0 to 9)

?? = Numeric value (00 and 10), Example "07-AR999999"

Firmware Images:

Firmware images required to run the Linux OS on the 400AP.

These images are stored in NAND flash.

AT91Bootstrap U-Boot Linux Kernel UBI filesystem

Firmware Images:

The 400AP comes with firmware pre-loaded in NAND flash during production. If the images have been erased from NAND flash, replacement images are located on the Janus website under 400AP downloads. Look for the firmware archive that matches the serial number on your product label.

http://www.janus-rc.com/400ap_downloads.html

The Linux Kernel and UBI filesystem images are generated from the Buildroot toolchain. If you would like to customize your own Kernel and filesystem you will need to setup the Buildroot toolchain. Please reference the following document for configuring the Buildroot toolchain for use with the 400AP.

400AP Application Note - Buildroot Toolchain Installation for the 400AP



Terminal Emulator:

A Terminal Emulator on your development PC is needed in order to communicate with the 400AP console serial port (Front Panel DB9 Connector). The serial console port exposes the 400AP Linux Command Line Interface(CLI). The following instructions are for minicom, but you can use any Terminal Emulator you are comfortable with.



The following instructions assume you are a normal Linux user (not root) without privileges to access serial ports. The instructions are based on the use of the sudo package. All commands referenced below will be issued at the PC's Linux CLI

Step 1. Opening a terminal on your PC in order to access the PC's Linux CLI.

For default Unity Desktop of Ubuntu 11.04 or later.

 $\mathsf{Dash} \to \mathsf{More} \ \mathsf{Apps} \to \mathsf{Accessories} \to \mathsf{Terminal}$

For default Gnome Desktop of releases earlier than Ubuntu 11.04. Applications menu \rightarrow Accessories \rightarrow Terminal

Step 2. Making required 400AP hardware connections.

Connect 400AP Console serial port (Front Panel DB9 Connector) to your PC's serial port using a standard serial cable. Apply power to 400AP.

Step 3. Configuring minicom serial port parameters.

Type the following command at Linux PC's CLI: sudo minicom –s Enter your Linux user password if prompted. Follow the on screen menus to configure the following parameters: Serial Device: /dev/ttyS0 (System dependent) Bps/Par/Bits: 115200 8N1 Hardware Flow Control: No Software Flow Control: No

Save setup as DF1 before exiting.

Step 4. Starting minicom Serial Communication Program.

Type the following command at Linux PC's CLI: sudo minicom -o At this point you have a connection to the 400AP console port.



RomBOOT Mode:

RomBOOT mode is an operational state that allows firmware upload into NAND flash via Atmel's SAM-BA application. If firmware has been erased the 400AP will automatically boot into RomBOOT mode. Under this condition the red and green LED's will not illuminate and the only indication that RomBOOT mode has been entered is that "RomBOOT" will be displayed via the 400AP console port.

The 400AP is shipped from the factory with a production image that includes a low level bootloader. The bootloader is a modified version of Atmel's AT91bootstrap. On boot the 400AP runs AT91bootstrap and RomBOOT mode is not entered.

The following instructions assume the custom version of AT91bootstrap is loaded into NAND flash. Follow these instructions to bypass AT91bootstrap and boot into RomB00T mode.

Step 1. Power the 400AP.

- Step 2. Press and hold the Mode button.
- Step 3. Press and release the Reset button while continuing to press the Mode button.
- Step 4. Release Mode button after green LED illuminates.
- Step 5. The 400AP will be in RomBOOT mode when the green LED illuminates.

RomBOOT will be displayed via the 400AP console port after the 400AP boots into RomBOOT mode.

Step 6. Connect a USB cable to the USB device port of the 400AP. The other end of the USB cable connects to a USB host port of your PC running the SAM-BA application.

SAM-BA:

Atmel's SAM-BA application is used to write firmware images to flash memory of the 400AP. Janus has customized the SAM-BA installation for use with the 400AP. The instructions in this application note reference this customized version of SAM-BA. Please reference the following document for configuring SAM-BA for use with the 400AP.

400AP Application Note - Atmel SAM-BA Installation for Janus 400AP Products

Step 1. Entering RomBOOT mode.



Refer to RomBOOT Mode section of this application note.



SAM-BA continued:

Step 2. Starting SAM-BA application – continued.

Open a terminal on your PC in order to access the PC's Linux CLI.

For default Unity Desktop of Ubuntu 11.04 or later.

 $\mathsf{Dash} \to \mathsf{More} \ \mathsf{Apps} \to \mathsf{Accessories} \to \mathsf{Terminal}$

For default Gnome Desktop of releases earlier than Ubuntu 11.04.

Applications menu \rightarrow Accessories \rightarrow Terminal

Type the following command at Linux PC's CLI:

sudo ~/sam-ba_janus/sam-ba

Enter your Linux user password if prompted.

Step 3. When prompted configure the following options and then select Connect

SAM-BA (CDC 2.11	JOX
Select the connection :	: /dev/ttyACM0	•
Select your board :	at91sam9g20-400ap(N)	-
JLink speed :	default	-
	Customize lowle	evel
Connect	Exit	

Step 4. To program NAND Flash it must first be enabled.

Select the Enable NandFlash script from the drop down menu and click the Execute button.

NAND Flash needs to be enabled every time you start SAM-BA.

Filo Scri			AM-BA CDC 2	.11 - at91san	19g20-400ap(N)			
iie Seli	ipt File	Link Help						
at91sam9	9g20 Mer	mory Display —						
Start Add		200000	Rofroch	Display format-		- Ap	oplet traces o	n DBGU
Size in byt	te(s) : 0x	100	Refresh	🔿 ascii 🔿 8-b	it 🔿 16-bit 💿 32-b	it inf	fos	Apply
0x002	200000	0xEA000020	0xffffffff	0x00000000	0x04000000			
0x002	200010	0x0020122C	0x00000000	0x00000000	0x0000010			
0x002	200020	0x00000000	0x00000000	0x00000000	0x00000000			
0x002	200030	0x00000000	0x00000000	0x00000000	0x00000000			
1						(
Receive	Addres	e : s : 0x0	Size (For Reg	ceive File) : 0x10	00 byte(s)	Compare	Receive File sent file wit	e h memory
Scripts								
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Uploading Firmware Images to Flash:

The following section describe how to load each of the required firmware images into NAND flash. The following diagram defines where each image is located in NAND flash.



The following sections are written with the assumption that you are only writing one image at a time. If you are writing all images at the same time you will only need to enter RomBOOT mode and launch SAM-BA one time.

If you have setup the Buildroot toolchain and have built your own Kernel and filesystem you don't need to reload Bootstrap and U-Boot when uploading the Kernel and filesystem.

Janus supplies a single image file that contains the Full Production image to allow you to restore the 400AP to original factory settings. Follow the Upload Full Production Image section to restore factory default setting.

Uploading Bootstrap Image:

Step 1. Starting SAM-BA application.



Refer to SAM-BA section of this application note.



Don't forget to Enable NAND Flash!



Uploading Bootstrap Image continued:

Step 2. Uploading Bootstrap image.

Select the Send Boot Image script from the drop down menu.

Click the Execute button.

iile Script File Link Help at91sam9g20 Memory Display Applet traces on DBGU Start Address: (0x200000) Refresh Display format Applet traces on DBGU 0x0020000 0xEA000020 0xFFFFFFF 0x0000000 0x00400000 0x0020000 0x0020000 0x0020122 0x0000000 0x0000000 0x0000000 0x0000000 0x00200020 0x0000000 0x0000000 0x0000000 0x0000000 0x0000000 0x00200030 0x0000000 0x0000000 0x0000000 0x0000000 0x0000000 0x00200030 0x00000000 0x0000000 0x00000000 0x00000000 0x00000000 0x0020030 0x00000000 0x0000000 0x0000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x0000000000 0x00000000 0x00000000 0x00000000 0x00000000 0x00000000 0x000000000000 0x00000000 0x0000000 0x0000000 0x00000000 0x00000000 0x00000000000000000000000000000000000		5	AM-BA CDC 2	2.11 - at91san	19g20-400ap(N)	
at91sam9g20 Memory Display Start Address : [0x200000 Refresh Display format Applet traces on DBGU ize in byte(s) : [0x100 ascii @ 8-bit @ 16-bit @ 32-bit Infos @ Appl 0x00200000 0xEA000020 0xFFFFFFFF 0x0000000 0x0000000 0x0020000 0x0020122C 0x0000000 0x0000000 0x0000000 0x00200020 0x0000000 0x0000000 0x00000000 0x00000000 0x00200020 0x0000000 0x0000000 0x00000000 0x00000000 0x00200020 0x0000000 0x0000000 0x00000000 0x00000000 0x00000000 0x00000000 0x0000000 0x00000000 0x00000000 1andFlash SDRAM SRAM 2 Execute Compare sent file with memor Send File Image: Image: Image: Image: Image: Send Boot File Image:	ile Script File	Link Help				
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0x00200030 0x0000000 0x0000000 0x0000000 andFlash SDRAM SRAM SRAM 2 -Download / Upload File Send File Send File Name : Send File Receive File Name : Address : 0x0 Size (For Receive File) : 0x1000 byte(s) Compare sent file with memory Send File Compare sent file with memory -Scripts Send Boot File Execute NANDFLASH::Init (trace level : 4) Loading applet applet-nandflash-at91sam9g20.bin at address 0x20000000 Memory Size : 0x800000 bytes Buffer address : 0x20002DA4 Buffer size: 0x20002DA4 Buffer size: 0x20000 bytes Applet initialization done mh) 1 % Tanget address Tanget address	0x00200020	0x00000000	0x00000000	0x00000000	0x0000000	
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Buffer address : 0x20003DA4 Buffer size: 0x2000 bytes Applet initialization done mh) 1 %	Memory Size : 0	x8000000 bytes	;	.bin at address (X20000000	
Applet initialization done mh) 1 %	Butter address : Buffer size: 0x2	0x20003DA4				
	Size: OKZ	0000 bytes				
(dov/ttvACM0_Board : at01cam0a20.400	Applet initializat	tion done				

When prompted navigate to and select the Bootstrap image.

Click Open button to write the Bootstrap image to NAND flash.

	Open	×
Directory:	/home/tomh/bootstrap/v21	- £
E bootstra	p_400ap_v2.1-21.bin	
4		Þ
File <u>n</u> ame	: bootstrap_400ap_v2.1-21.bin	<u>O</u> pen
Files of <u>t</u> ype	e: Bin Files (*.bin)	<u>C</u> ancel



Uploading U-Boot Image:

Step 1. Starting SAM-BA application.



Refer to SAM-BA section of this application note.



Don't forget to Enable NAND Flash!

Step 2. Erasing U-Boot NAND flash location.

Select the Erase U-Boot Location script from the drop down menu.

Click the Execute button to erase flash.

File Script File		APPBA CDC 2	.ii - ataisan	19g20-400ap(N)	
ric script rile	Link Help				
at91sam9g20 Mer	mory Display				
Start Address : 0x	200000	Refresh	Display format		Applet traces on DBGU
Size in byte(s) : 0x	100		🔿 ascii 🔿 8-bi	it 🔆 16-bit 💿 32-b	it infos 👻 Apply
0x00200000	0xEA000020	0xffffffff	0x00000000	0x04000000	
0x00200010	0x0020122C	0x00000000	0x00000000	0x0000010	
0x00200020	0x00000000	0x00000000	0x00000000	0x00000000	
0x00200030	0x00000000	0x00000000	0x00000000	0x00000000	
J					
Receive File Nam Addres	ie : is : 0x0	Size (For Red	ceive File) : 0x10	00 byte(s)	Receive File
Corinto					
Scripts	cation (0x20000	to 0x1FFFFF)		 Execute 	



Uploading U-Boot Image continued:

Step 3. Uploading U-Boot image to NAND flash.

Enter 0x20000 in the Address field.

	tha	c
JIICK	me	
011011		L

icon next to the Send File Name field.

When prompted navigate to and select the U-Boot image.

Click Open button.

Click Send File to upload image.

After the image has finished uploading, verify image has been written correctly by clicking Compare sent file with memory.

	s	AM-BA CDC 2	.11 - at91sam	9g20-400ap(N)		_ 0 ×
File Script File	Link Help					
_at91sam9g20 Me	mory Display —					
Start Address · Ox	200000	Refresh	Display format		Apple	t traces on DBGU
Size in hyte(s) : 0x	(100	Refresh	🔿 ascii 🔿 8-bi	t 🔿 16-bit 💿 32-	bit infos	 Apply
Size in Dyte(s) . 07	0	0	00000000	004000000		
0x00200000	0xEA000020	UXFFFFFFF	0x00000000	0x04000000		
0x00200010	0x0020122C	0x00000000	0x00000000	0x00000010		
0x00200020	0x0000000	0x00000000	0x00000000	0x00000000		
0x00200030	0x00000000	0x00000000	0x00000000	0x00000000		V
Send File Nam Receive File Nam Addres	ne : u-boot_2013. ne : ss : 0x20000	10_400ap_v3.0. Size (For Rec	bin ceive File) : 0x100	20 byte(s)	Re Compare se	Send File eceive File ent file with memory
Scripts	cation (0x20000	to 0x1FFFFF)		▼ Execute		
ess 0x20000 -I- File size : 0x3E1 -I- Writing: (-I- 0x20000 -I- Writing: (-I- 0x1E194 (tomh) 1 %	94 byte(s) 0x20000 bytes a bytes written by 0x1E194 bytes a bytes written by	at 0x20000 (buff y applet at 0x40000 (buff y applet	fer addr : 0x2000 fer addr : 0x2000)3DA4))3DA4) /dev/tty4	ACM0 Board : a	t91sam9g20-400ap(N)



U-Boot environmental variables have been erased. The environmental variables need to be rewritten before you can boot the 400AP. Please refer to U-Boot Environmental Variables section of this application note. This can wait until you exit SAM-BA and reboot.



Uploading Kernel Image:

Step 1. Starting SAM-BA application.



Refer to SAM-BA section of this application note.



Don't forget to Enable NAND Flash!

Step 2. Erasing Kernel NAND flash location.

Select the Erase Kernel Location script from the drop down menu.

Click the Execute button to erase flash.

	S	AM-BA CDC 2	.11 - at91san	19g20-400ap(N)	
File Script File	Link Help				
at91sam9g20 Mer	mory Display				
Start Address : 0x	200000	Refresh	Display format-		Applet traces on DBGU
Size in byte(s) : 0x	100		🔿 ascii 🔿 8-b	it 🔿 16-bit 💿 32-	bit infos 👻 Apply
512C III Dyte(3) . 03	0	0	00000000	004000000	
0x00200000	0xEA000020	OXFFFFFFF	0x00000000	0x04000000	
0x00200010	0x0020122C	0x00000000	0x0000000	0x00000010	
0x00200020	0x0000000	0x00000000	0x0000000	0x0000000	
0x00200030	0x00000000	0x00000000	0x00000000	0x00000000	
Receive File Nam	e : ss : 0x0	Size (For Re	ceive File) : 0x10	00 byte(s)	Receive File Compare sent file with memory
- Scripts					
Erase Kernel Loc	ation (0x200000	to 0x3FFFFF)		▼ Execute	
-I- Buffer address : -I- Buffer size: 0x20 -I- Applet initializat (tomh) 1 % NANDF -I- Erase blocks from add	0x20003DA4 0000 bytes tion done LASH::EraseBloo m start 0x20000	cks 0x200000 0 00 to 0x3FFFF	x3FFFFF		



Uploading Kernel Image continued:

Step 3. Uploading Kernel image to NAND flash.

Enter 0x200000 in the Address field.

Click the 📂 icon next to the Send File Name field.

When prompted navigate to and select the Kernel image.

Click Open button.



If using the Buildroot toolchain as configured for the 400AP the Kernel image will be named, ulmage. You will not be able select this image from within SAM-BA application without renaming the file with a file extension.

Example: Rename file ulmage to ulmage.bin

Another option is to create a symbolic link for ulmage.bin that references ulmage.

Example: ~/buildroot/output/images \$ In -s ulmage ulmage.bin

Click Send File to upload image.

After the image has finished uploading, verify image has been written correctly by clicking Compare sent file with memory.

	s	AM-BA CDC 2	.11 - at91sam	9g20-400ap(N)		_ D X
File Script File	Link Help					
at91sam9g20 Mer	nory Display —					
Start Address · Ox	200000	Refresh	Display format		Applet traces on	DBGU
Start Address . 0x	100	Refresh	🔿 ascii 🔿 8-bi	t 🔿 16-bit 💿 32-	bit infos 💌	Apply
Size in Dyte(s) . 0x	100	0	0.0000000	0.04000000		
0x00200000	0xEA000020	UXFFFFFFFFF	0x00000000	0x04000000		
0x00200010	0x0020122C	0x00000000	0x00000000	0x00000010		
0x00200020	0x00000000	0x00000000	0x00000000	0x00000000		
0x00200030	0x00000000	0x00000000	0x00000000	0x00000000		
NandFlash SDPA		Mol				
SDRA		112				
Download / Uplo	ad File					
Send File Nam	e : uImage.bin			2	Send File	
Receive File Nam	e :			2	Receive File	
Addres	s : 0x200000	Size (For Red	ceive File) : 0x100	00 byte(s)	Compare sent file with	memory
Cariata	· · · · · · · · · · · · · · · · · · ·		1			
Scripts				_		
Erase Kernel Loc	ation (0x200000	to 0x3FFFFF)		 Execute 		
-I- Writing: 0	bytes written b	v applet	ifter addr : 0x200	JU3DA4)		A
-I- Writing: C	x20000 bytes a	t 0x3C0000 (bu	iffer addr : 0x200	03DA4)		
-l- 0x20000	bytes written by	y applet at 0x350000 (bu	ffor addr - 0x200			
-l- 0x126C0	bytes written b	y applet	iner addi : 0x200	(05DA4)		
(tomh) 1 %	-	- · ·				
				/dev/ttyA	CM0 Board : at91sam9g2	20-400ap(N)



Uploading Filesystem Image:

Step 1. Starting SAM-BA application.



Refer to SAM-BA section of this application note.



Don't forget to Enable NAND Flash!

Step 2. Erasing Filesystem NAND flash location.

Select the Erase Filesystem Location script from the drop down menu.

Click the Execute button to erase flash.

5		AM-BA CDC 2	.11 - at91sam	19g20-400ap(N)		
File Script File I	Link Help						
at91sam9g20 Mem	ory Display						
Start Address : 0x2	00000	Refresh	Display format			Applet trac	es on DBGU
Size in buto(s) : 0x1	00	nenesii	🔿 ascii 🔿 8-bi	it 🔿 16-bit 💌 33	2-bit	infos	 Apply
512e 11 byte(3) . 0x1	0	0	00000000	00.1000000			
0x00200000	0xEA000020	OXPEPEPEPE	0x00000000	0x04000000			
0x00200010	0x00201220	0x0000000	0x00000000	0.000000000			
0x00200020	0x00000000	0x00000000	0x00000000	0x00000000			
0x00200030	0x00000000	0x0000000	0x00000000	0x00000000			
s							
Receive File Name	:				•	Receive	e File
Address	: 0x0	Size (For Red	ceive File) : 0x100	00 byte(s)	Cor	mpare sent file	with memory
Scripts							
Frase Filesystem I	ocation (0x400	1000 to 0x3EEEE	FF)	Execute			
Lerabe Fileby Sceni E	ocación (oxroc						
- Butter address : 0	x20003DA4						
- Butter address : 0 - Buffer size: 0x200 - Applet initializatio	000 bytes						
- Butter address : C - Buffer size: 0x200 - Applet initializatio omh) 1 % NANDFL	x20003DA4 000 bytes on done ASH::EraseBloo	:ks 0x400000 0:	x3FFFFFF				
- Butter address : 0 - Buffer size: 0x200 - Applet initialization omh) 1 % NANDFLA - Erase blocks from - Blocks from address	x20003DA4 000 bytes on done ASH::EraseBloo I start 0x40000	cks 0x400000 0: 00 to 0x3FFFFFF	x3FFFFFF				
Buffer address : 0 Buffer size: 0x200 Applet initializatio omh) 1 % NANDFU Erase blocks from addre omh) 1 %	x20003DA4 000 bytes on done ASH::EraseBloo 1 start 0x40000 255 0x400000	cks 0x400000 0: 00 to 0x3FFFFF to 0x3FFFFFF er	x3FFFFFF				



Uploading Filesystem Image continued:

Step 3. Uploading Filesystem image to NAND flash.

Enter 0x400000 in the Address field.

Click the 📂

彦 icon next to the Send File Name field.

When prompted navigate to and select the Filesystem image.

Click Open button.



If using the Buildroot toolchain as configured for the 400AP the filesystem will be named, rootfs.ubi.

~/buildroot/output/images/rootfs.ubi

Click Send File to upload image.

After the image has finished uploading, verify image has been written correctly by clicking Compare sent file with memory.

ļ	9	SAM-BA CDC 2	.11 - at91sam	19g20-400ap	(N)			
File Script File	Link Help							
at91sam9g20 Me	mory Display —							
Start Address : 0x200000 Befresh		Refresh	Display format			Applet traces on DBGU		
Size in byte(s) : 0x100		Refresh	🗌 🔿 ascii 🔿 8-bit 🔿 16-bit 💿 32-bit		32-bit	infos	 Apply 	
Size in byte(s) : 0x	.100							
0x00200000	0xEA000020	OxFFFFFFFF	0x00000000	0x04000000				
0x00200010	0x0020122C	0x00000000	0x00000000	0x0000010				
0x00200020	0x00000000	0x00000000	0x00000000	0x0000000				
0x00200030	0x00000000	0x00000000	0x00000000	0x00000000				
4								
Receive File Nam	Receive File Name :				2	Receive File		
Addres	s : 0x400000	Size (For Re	ceive File) : 0x10	00 byte(s)	С	ompare sent file	with memory	
Scripts								
Erase Filesystem	Location (0x40)	0000 to 0x3FFFF	FF)	- Execu	ite			
, .				-				
		- A						
0x20000	bytes written b	v applet	utter addr : 0x2	JUUSDA4)				
Writing: (0x20000 bytes a	at 0x1520000 (b	uffer addr : 0x2	0003DA4)				
0x20000 Writing: (bytes written b	y applet at 0x1540000 (F	uffer addr · 0v2	003044)				
0x20000	bytes written b	y applet	arren auur . UX2	5555DR4)				
omh) 1 %	-							

Uploading Full Production Image:

Step 1. Starting SAM-BA application.



Refer to SAM-BA section of this application note.



Don't forget to Enable NAND Flash!

Step 2. Erasing NAND flash.

Select the Erase All script from the drop down menu.

Click the Execute button to erase flash.

File Script File		AM-BA CDC 2	.ll - at9lsam	19g20-400ap(N)	
	Link Help				
at91sam9g20 Me	mory Display —				
Start Addross - 0x200000		Rofroch	Display format	Applet traces on DBGU	
Size in hyte(s) : 0x100		Refresh	🔿 ascii 🔿 8-bi	t 🗆 16-bit 💿 32-	bit infos 👻 Apply
Size in byte(s) : 0x	100				
0x00200000	0xEA000020	OxFFFFFFFF	0x00000000	0x04000000	
0x00200010	0x0020122C	0x00000000	0x0000000	0x0000010	
0x00200020	0x00000000	0x00000000	0x00000000	0x0000000	
0x00200030	0x0000000	0x00000000	0x0000000	0x0000000	7
1					
Send File Nam	le :			~	Send File
Receive File Nam	ie :			<u> </u>	Send File Receive File
Receive File Nam Addres	ie : is : 0x0	Size (For Red	ceive File) : 0x100	00 byte(s)	Send File Receive File Compare sent file with memory
Send File Nam Receive File Nam Addres Scripts	ie : is : 0x0	Size (For Red	ceive File) : 0x100	00 byte(s)	Send File Receive File Compare sent file with memory
Send File Nam Receive File Nam Addres Scripts Erase All Erasing blocks Erasing blocks	batch 2 batch 4	Size (For Red	ceive File) : 0x100	0 byte(s)	Send File Receive File Compare sent file with memory
Receive File Nam Addres Scripts Frasing blocks Erasing blocks Erasing blocks Erasing blocks Erasing blocks Erasing blocks Erasing blocks	batch 2 batch 3 batch 4 batch 5 batch 5 batch 6 batch 7	Size (For Red	ceive File) : 0x100	00 byte(s)	Send File Receive File Compare sent file with memory



Uploading Full Production Image continued:

Step 3. Uploading Full Production image to NAND flash.

Enter 0x0 in the Address field.

	the	~
JIICK	uie	

icon next to the Send File Name field.

When prompted navigate to and select the Full Production image.

Click Open button.

Click Send File to upload image.

After the image has finished uploading, verify image has been written correctly by clicking Compare sent file with memory.

		AM-BA CDC 2	.11 - at91sam	19g20-400ap(N)			
File Script File	Link Help						
at91sam9g20 Mer	mory Display						
Start Address : 0x	200000	Befresh	Display format			Applet trac	es on DBGU
Size in byte(s) : 0x100			🔿 ascii 🔿 8-b	it 🔿 16-bit 💿 32-b	it	infos	 Apply
0=00200000	0	0	0*0000000	0=04000000			
0x00200000	0xEA000020	0.00000000	0x00000000	0x04000000			
0x00200010	0x00201220	0x00000000	0x00000000	0x00000010			
0x00200020	0x00000000	0x00000000	0x00000000	0x00000000			
0x00200030	0x00000000	0x0000000	0x00000000	0x0000000			
٢							≥
Receive File Nam	Receive File Name :					Receive	e File
Addres	s : 0x0	Size (For Reg	ceive File) : 0x10	00 byte(s)	Con	npare sent file	with memory
Cavinta							
- Scripts							
Erase All				▼ Execute			
Erase All				▼ Execute			
Erase All				▼ Execute			
Erase All)x20000 bytes a	it 0x1860000 (b	putter addr : 0x20	Execute			
Erase All Writing: 0 0x20000 Writing: 0)x20000 bytes a bytes written b)x20000 bytes a	at 0x1860000 (b y applet at 0x1880000 (b	outter addr : 0x20 outfer addr : 0x20	Execute Execute D003DA4) 0003DA4)			
Vinting: 0 Writing: 0 0x20000 Writing: 0)x20000 bytes a bytes written b)x20000 bytes a bytes written b	at 0x1860000 (b y applet at 0x1880000 (b y applet	outter addr : 0x20 outfer addr : 0x20	Execute Execute D003DA4) D003DA4) D003DA4)			
Erase All Writing: (0x20000 Writing: (0x20000 Writing: (0x20000)x20000 bytes a bytes written b)x20000 bytes a bytes written b)x20000 bytes a bytes written b	at 0x1860000 (b y applet at 0x1880000 (b y applet it 0x18A0000 (b y applet	outter addr : 0x20 ouffer addr : 0x20 ouffer addr : 0x2	Execute Execute 0003DA4) 0003DA4) 0003DA4)			
Scripts Erase All • Writing: (• 0x20000 • Writing: (• 0x20000 • Writing: (• 0x20000 • 0x20000 • 0x20000 • 0x20000	0x20000 bytes a bytes written b 0x20000 bytes a bytes written b 0x20000 bytes a bytes written b	it 0x1860000 (b y applet st 0x1880000 (b y applet it 0x18A0000 (b y applet	outter addr : 0x20 ouffer addr : 0x20 ouffer addr : 0x2	Execute Execute 0003DA4) 0003DA4) 0003DA4)			

The Full Production image supplied by Janus does not contain the 400AP Ethernet port MAC address. Please refer to U-Boot Environmental Variables section of this application note. You will only need to enter the setenv ethaddr command as the bootcmd and bootargs are stored in the Full Production image.



U-Boot Environmental Variables:

If you have erased U-boot environmental variables you will need to rewrite them in order to boot the 400AP into Linux. Follow these instructions to restore U-boot environmental variables.

Step 1. Resetting the 400AP

Press the Reset button on front panel of the 400AP.

Step 2. Entering the U-Boot environment during boot.

When prompted by U-Boot, hit any key to stop autoboot: The following prompt should be displayed:

U-Boot>

Step 3. Setting U-Boot environmental variables.

The following commands are for the 400AP using a UBI File System. At the U-Boot prompt enter the following U-Boot commands:

setenv bootcmd nand read 0x22000000 0x00200000 0x00200000\; bootm 0x22000000 setenv bootargs mem=64M console=ttyS0,115200 ubi.mtd=1 root=ubi0:rootfs rw rootfstype=ubifs setenv ethaddr xx:xx:xx:xx:xx:xx saveenv



xx:xx:xx:xx:xx should be substituted with the MAC address listed on the 400AP product label.

Step 4. Verifying U-boot environmental variables have been saved

At the U-Boot prompt enter the following U-Boot commands:

printenv

Expected response:

bootdelay=3 baudrate=115200 ethact=macb0 bootcmd=nand read 0x22000000 0x00200000 0x00200000; bootm 0x22000000 bootargs=mem=64M console=ttyS0,115200 ubi.mtd=1 root=ubi0:rootfs rw rootfstype=ubifs stdin=serial stdout=serial stderr=serial ethaddr=xx:xx:xx:xx:xx

Environment size: 262/131067 bytes

Step 5. Exiting the U-Boot environment.

At the U-Boot prompt enter the following U-Boot commands:

reset

This command will cause the 400AP to exit U-boot and boot into Linux.

