# AT88CK9000

Atmel Secure Personalization Kit for CryptoAuthentication

# **USER GUIDE**



Atmel AT88CK9000 Secure Personalization Kit

Downloaded from Arrow.com.

**Atmel** 

#### **Features**

- Single Push-button Triggers Parallel Programming
- Supports Programming of Up to (10) Devices at a Time for SOIC Package
- Supports Programming of Up to (5) Devices at a Time for TSSOP, UDFN, SOT23-3, or CONTACT
- Provides the Following Feedback:
  - Serial Number
  - Programming Count
  - Programming Limitation Count
  - Firmware Version
  - Device and Protocol
  - Verification Cycle
  - Status Lights For Pass/Fail per Device
  - Visual Feedback While Programming (Push Button Light is On)
- Embedded Power Controller
- Provides power to DUTs Only When Programming Load/Unload Safe
- Detects When Devices are Positioned Backwards and Cuts Power to Protect the Board
- Standard Micro-USB Used for Power and Configuration

#### Contents

- Atmel<sup>®</sup> AT88CK9000 Board
- Universal Power Supply Adaptor
- 0.5m USB Cable

#### Introduction

The AT88CK9000 secure personalization kit has been developed to securely personalize the Atmel CryptoAuthentication<sup>™</sup> ATSHA204A device series. Depending on the ordering code, the kit can securely personalize 8-lead SOIC, 8-lead TSSOP, 8-pad UDFN, 3-lead SOT23, and 3-lead RBH CONTACT packages. The 8-lead SOIC kit has sockets which can accommodate two devices per socket making it capable of personalizing up to 10 devices at a time. Safety and security has been added to ensure secure high-reliability programming.

The AT88CK9000 kit interfaces to the Atmel Crypto Evaluation Studio (ACES) software suite to provide communication to a PC via a USB interface. This allows trusted users to program the board outside of the manufacturing environment. Once programmed, the board becomes a standalone board. As a standalone board, it only requires power, after which, will allow the programming of the ATSHA204A devices. In addition, this board has an internal counter to keep track of how many devices were programmed, both in total, as well as by session.



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## Becoming Familiar with AT88CK9000 Board

The AT88CK9000 has been designed to make secure personalization of the CryptoAuthentication ATSHA204A devices as easy as possible.



Pass/Fail Indicators







# Install Atmel Crypto Evaluation Studio (ACES)

To download ACES, visit:

http://www.atmel.com/tools/ATMELCRYPTOEVALUATIONSTUDIO\_ACES\_.aspx.

Note: The AT88CK9000 kit is compatible with version 4.3.2 or later.

- 1. Launch the installer by executing the downloaded file (e.g. ACES\_Setup.exe).
- 2. Follow the installation instructions in the setup wizard.



3. Once installed, three ACES icons should be located on the desktop. These icons include:



4. The ACES Programmer icon will launch the ACES Programmer. See the following section, "Configuring the AT88CK9000 Board".



ACES CE recognizes the following kits.(Does not recognize the AT88CK9000):

- Atmel AT88CK101 Development Kit General Engineering, Combined Firmware
- Atmel AT88CK454BLACK Evaluation Kit ATSHA204A Rhino Black
- Atmel AT88CK427GREEN Evaluation Kit ATAES132 Rhino Green
- Atmel AT88CK460WHITE ATECC108 Rhino White
- Atmel AT88CK490 Evaluation Kit CryptoAuthentication
- AT88CK9000 Secure Personalization Kit for CryptoAuthentication [USER GUIDE] Atmel-8821C-CryptoAuth-AT88CK9000-Secure-Personalization-Kit-UserGuide\_122014



### Configuring the AT88CK9000 Board



Once ACES has been installed, begin configuring the ATSHA204A device to work in your system.



This step will not involve the AT88CK9000 board directly but is a preparation step before you can download the device configuration to the AT88CK9000 and subsequently program the multiple devices in the AT88CK9000.

The recommended method is to define and test the device configuration using the ACES Configuration Environment (CE). In order to use ACES CE, one of the compatible kits listed above that ACES CE recognizes is required. ACES CE does not recognize the AT88CK9000 as a development kit, however, ACES CE creates a personalization file which is targeted for the AT88CK9000 kit.

Save the personalization file in ACES CE:

- 1. Launch ACES CE:
  - From your desktop, select the ACES CE icon, or
  - From the Start Menu, select Start > Atmel Crypto Solutions > ACES > ACES CE.
- 2. Configure the working device to the desired configuration.
- 3. From ACES CE menu bar, select File > Save Personalization File ...





- 4. The *File Save As* dialog box will be displayed.
- 5. Check the checkbox for Save as 'Atmel Personalization'.



If the 'Atmel Personalization' checkbox is not checked and the resulting .shax file is downloaded into the AT88CK9000, an Invalid Format error during the download process will be produced.

- Select the 'Session Key Slot' that the ATCK9000 will use during programming. If the 'Session Key Slot' selector is empty, then define a slot from slot 6 to slot F to be Read:Secret/Write:Never (SlotConfig = 8F8F)
- 7. Check the 'Save Responses File (\*.shar)' checkbox if desired. The \*.shar file is a responses file that can be used with ACES CE to verify that parts are programmed properly. After programming parts, launch ACES CE select the Tools>Verify... menu then select the \*.shar file to verify.
- 8. Name the personalization file, and then select Save.

💽 Save Personalization File	? 💌
Save the current device configuration to the specified filename	
Personalization Filename:	
CK9000-Config.shax	
Save as 'Atmel Personalization'	
Part Number: ATSHA204A	
Session Key Slot: 8	
Save Responses File (*.shar)	
Save	



# Powering Up the AT88CK9000 Board

The AT88CK9000 board can be powered via the multi-voltage power supply which is supplied with the kit or via a USB port on a PC. Once powered, the green LED will illuminate next to the USB connector, and the green LEDs will illuminate below each socket.



LEDs are illuminated



# Putting the Board in Download Mode

There are two main modes the secure personalization board may be in:

- 1. Download Mode
- 2. Personalization (Programming) Mode

**Download** mode is used to initially load the configuration of the crypto parts – the configuration is created with ACES. It is typically done once before you start producing programmed parts with the AT88CK9000, but after you've tested the device configuration in your application. This order insures that when you start programming devices with the AT88CK9000 in higher quantities, those parts will be programmed with the tested configuration.

**Personalization** (Programming) mode is the default mode when the board is first powered up. It is the mode used most often and is used to personalize the crypto parts.

This section describes how to download the ACES to create the configuration file into the AT88CK9000.

1. Plug in the secure personalization board while holding the *Boot Select* button.

Holding the **Boot Select** button located on the back of the board while powering the board will put the board in the Download mode. The below image shows what should be shown on the display.



- 2. Download the file contents to the programmer board.
  - Select the ACES Programmer desktop icon to launch the ACES Programmer.
  - The *Personalize Programmer Board* dialog box will then be presented.
    - Notes: 1. The board is attached.
      - 2. The file is not selected.



Select a file that	contains the persor	nalization data		
Crypto Authenticat	tion Programmer Boa	rd: 48.118.48		
Personalization I	File:			
Preview File				
File Contents		Board Contents		
Filename:	No File Selected	Board ID:	394A0C8F878D	
Part Number:		Total Board Devices:	124076833	
Device Type:		Personalization ID:	2	
Protocol:		Device Type:	SHA204	
Secrets Zones:		Part Number:	ATSHA204-TSU-01-	г
Clear Zones:		Protocol:	TWI	
Legacy:		Total PersID Devices:	305419896	
		Max PersID Devices:	Unlimited	

- Select the XX button and select a personalization file. (Select the file that you have created using ACES CE.)
- 3. To load the contents of the file in preparation to download to the programmer board, select *Preview File.* The Programmer User Interface should resemble the below dialog box.

Select a file that	contains the personalization dat	8	
Crypto Authentica	tion Programmer Board: 48.118.48		
Personalization	File:		
Sha204PersTen	nplate.xml		
Preview File			
File Contents		Board Contents	
Filename:	Sha204PersTemplate.xml	Board ID:	394A0C8F876D
Part Number:	ATSHA204-TSU-01-T	Total Board Devices:	124076833
Device Type:	SHA204	Personalization ID:	2
Protocol:	TWI	Device Type:	SHA204
Secrets Zones:	0, 1, 2, 3, 4, 5, 6, 7, 8, 9, A, 8, E	Part Number:	ATSHA204-TSU-01-
Clear Zones:	C, D, F	Protocol:	TWI
Legacy:	Faise	<b>Total PersID Devices:</b>	305419896
		Max PersID Devices:	Unlimited
	6	Download	



#### 4. Select Download.

- If download is successful, the download confirmation dialog box will be displayed.



- If download is not successful, the unsuccessful download dialog box will be displayed.



- 5. Once the board has been successfully loaded with the new configuration, either:
  - Unplug the USB cable from the board, or
  - Press the **Reset** button located on the back of the board.

The AT88CK9000 display should display the communication panel screen as shown below which indicates your board is ready to personalize (program) parts.

Statistical and statistical an	
Device: SHA204 - TWI	<b>Device</b> = Device Type and Protocol
Count-1: 124070833 Count-S: 305419896	<b>Count–T</b> = Lifetime Count of Programmed Devices
S/N: 39060C8FB7BD FW: 0v001	<b>Count–S</b> = Session Count of Programmed Devices
Status: READY	Limit = Configurable Limit Per Session
Atmel	S/N = Unique Serial Number
CryptoAuthentication AT88CK9000	FW = Firmware Revision
A CARGE CONTRACTOR	Status = Board Status

6. Congratulations, the AT88CK9000 board is up and running. You may now load the devices into the sockets and press the Program button when ready to program the parts.



Be sure to test the first few programmed devices before mass programming additional devices.



# Firmware Upgrade/Recovery

To perform a firmware recovery or upgrade, the follow the next steps:

1. Download and install Atmel SAM-BA<sup>®</sup> In-system Programmer from the following link: http://www.atmel.com/tools/ATMELSAM-BAIN-SYSTEMPROGRAMMER.aspx



If using Windows, download and install the atm6124 CDC USB driver for Windows on the located on the link above or use the below direct link: http://www.atmel.com/images/atm6124\_cdc\_signed.zip

- Download and unzip the AT88CK9000 SAM-BA patch from the following link: http://www.atmel.com/tools/AT88CK9000.aspx
- 3. Copy the directory located under at88ck9000-SAM-BA-v2.11-patch: tcl\_lib



4. Paste the *tcl\_lib* directory inside the SAM-BA installation directory.

	*				0	- 242	
3	Name	Date modified	Туре	Size			
	applets	7/6/2012 11:57 PM	File folder				
	퉬 doc	7/6/2012 11:57 PM	File folder				
	퉬 drv	7/6/2012 11:57 PM	File folder				
	🌗 examples	7/6/2012 11:57 PM	File folder				
	🍌 tcl_lib	7/7/2012 12:01 AM	File folder				
	駵 sam-ba.exe	10/23/2011 10:47	Application	1,601 KB			
	🞯 Uninstall.exe	7/6/2012 11:57 PM	Application	59 KB			



5. Plug the board to a computer USB port.



6. Using a metal object, short the *Firmware-Erase* pads to enable the USB Bootloader, then simultaneously reset the board using the reset switch on the bottom of the board.



AT88CK9000 will appear as a virtual COM port: AT91 USB to Serial Converter (COMxx).



7. Open the device manager to check the COM port number.



8. Launch SAM-BA and select the board AT88CK9000-AT91SAM3U4 > then select Connect.



9. Select OK.





10. From the Scripts drop-down menu, select Enable Flash Access > select Execute.

Start Address : 0x200	00000 Refresl	Display for	mat			ГАрр	olet traces on D
Size in byte(s) : 0x100		C ascii (	8-bit 🤆 16-bit	32-bit		info	s 💌 Ap
0x20000000	0x0000001	0x00000000	0x0018034B	0x00180	34D		
0x20000010	0x00180333	0x0018033F	0x00180C1B	0x00180	CB9		
0x20000020	0x0001C200	0x00080000	0x000021A1	0x00070	000		
0x20000030	0x00430209	0xC0000102	0x00040900	0x02020	100		
0+0000040	0-24050000	0+04011000	0********	0+01000	674		
Download / Uploa Send File Name Receive File Name	d File			8 8		Send File Receive File	
Download / Uploa Send File Name Receive File Name Address	d File : : : : 0x80000 Siz	e (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with r	memory
Download / Uploa Send File Name Receive File Name Address Scripts	d File :	e (For Receive File	) : [0x1000 byte	(s)	Compa	Send File Receive File re sent file with n	nemory
Download / Uploa Send File Name Receive File Name Address Scripts Enable Flash access	d File	e (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with n	nemory
Download / Uploa Send File Name Receive File Name Address Scripts Enable Flash access Boot from Flash (0) Boot from Rob (G)	d File : : : : : : : : : : : : :	e (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with n	nemory
Download / Uploa Send File Name Receive File Name Address Scripts Enable Flash access Boot from Flash (G) Boot from ROM (G) anable Flash access	d File : : : : : : : : : : : : : : : : : : :	e (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with r	nemory
Download / Uploa Send File Name Receive File Name Address Scripts Enable Flash access Boot from Flash (G Boot from ROM (G Boot from ROM (G Scot Fich Robert Scotter)	d File : : : : : : : : : : : : :	re (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with n	nemory
Download / Uploa Send File Name Receive File Name Address Scripts Enable Flash access Boot from Flash (0) Boot from ROM (G) Control Flash (0) Rom File Flash access Scale Flash access S	d File : : : : : : : : : : : : :	re (For Receive File	): 0x1000 byte	(s)	Compa	Send File Receive File re sent file with n	nemory

11. From the Scripts drop-down menu, select Boot from Flash (GPNVM1) > select Execute.

File Script File Link Help			
at91sam3u4 Memory Display			
Start Address : 0x20000000 Refresh	1		Applet traces on
Size in byte(s) : 0x100 Cascii C 8-bit C 16	5-bit 🍳 32-bit		infos 💌 A
0x20000000 0x00000001 0x0000000 0x00180	34B 0x0018034	D	
0x20000010 0x00180333 0x0018033F 0x00180	C1B 0x00180CH	39	
0x20000020 0x0001C200 0x00080000 0x00002	1A1 0x0007000	00	
0x20000030 0x00430209 0xC0000102 0x00040	900 0x0202010	00	
0-0000040 0-04050000 0-04011000 0-05000			
Flash 0   Flash 1   SRAM   SRAM 1			
Flash 0 Flash 1 SRAM SRAM 1 Download / Upload File		Sen	d File
Flash 0 Flash 1 SRAM SRAM 1 Download / Upload File Send File Name : Provine File Name :	<u>8</u>	Sen	d File
Flash 0   Flash 1   SRAM   SRAM 1   Download / Upload File Send File Name : Receive File Name :	<u>8</u>	Sen Rece	d File ive File
Flash 0     Flash 1     SRAM     SRAM 1       Download / Upload File       Send File Name :       Receive File Name :       Address :     0x80000       Size (For Receive File) :       0x1000	 ☞ byte(s)	Sen Rece Compare sent 1	d File ive File file with memory
Flash 0 Flash 1 SRAM SRAM 1 Download / Upload File Send File Name : Receive File Name : Address : 0x80000 Size (For Receive File) : 0x1000 Scripts	byte(s)	Sen Rece Compare sent t	d File ive File file with memory
Flash 0     Flash 1     SRAM 1       Download / Upload File       Send File Name :       Address :     0x80000       Scripts       Boot from Flash (GPNVM1)	byte(s)	Sen Rece Compare sent l	d File ive File file with memory
Flash 0     Flash 1     SRAM     SRAM 1       Download / Upload File     Send File Name :     Receive File Name :       Address :     0x80000     Size (For Receive File) :       Scripts     Boot from Flash (GPNVM1)	byte(s)	Sen Rece Compare sent l	d File ive File file with memory
Flash 0     Flash 1     SRAM     SRAM 1       Download / Upload File     Send File Name :     Receive File Name :       Address : 0x80000     Size (For Receive File) :     0x1000       Scripts     Boot from Flash (GPNVM1) <ul> <li>Exe</li> <li>Boot from Flash (GPNVM1)</li> <li>Exe</li> <li>Exet file harmer</li> <li>Exe</li> <li>Exet file harmer</li> <li>Exe</li> <li>Exet file harmer</li> <li>Exet file</li></ul>	byte(s)	Sen Rece Compare sent t	d File ive File file with memory



12. From the Scripts drop-down menu, select Erase All Flash > select Execute.

File Script File	Link Help						
at91sam3u4 Memor	y Display						
Start Address : 0x20	000000 Refre	sh Display for	mat	1		Applet	traces on D
Size in byte(s) : 0x10		C ascii C	8-bit C 16-bit	32-bit		infos	• Ap
0x20000000	0x00000001	0x00000000	0x0018034B	0x0018034D			
0x20000010	0x00180333	0x0018033F	0x00180C1B	0x00180CB9			
0x20000020	0x0001C200	0x00080000	0x000021A1	0x00070000			
0x20000030	0x00430209	0xC0000102	0x00040900	0x02020100			
Flash 0   Flash 1   S	SRAM   SRAM1	0w04011000	0+05000034	0-01000624			
Flash 0   Flash 1   S Download / Uplos Send File Name	RAM   SRAM1	0+04011000 III	0+05000004	0x01000524	Ser	nd File	
Flash 0   Flash 1   S Download / Uplos Send File Name Beceive File Name	0w240E00000           iRAM   SRAM1             id File           i	0×04011000 III	0*05000274	20001000634	See	nd File	
Flash 0 Flash 1 S Download / Uplow Send File Name Receive File Name	GRAM   SRAM1   ad File	0+04013000 III	0+05000224	awa1000624	Ser	nd File	
Flash 0 Flash 1 S Download / Uplos Send File Name Receive File Name Address	0w240500000           iRAM   SRAM1             ad File           ::           ::           ::           ::           ::           ::           ::           ::           ::           ::           ::	Own 403 3 000 III	0x05000224	Own1000624           Image: State S	Ser Rece Compare sent	nd File sive File file with mer	mory
Flash 0 Flash 1 S Download / Uplos Send File Name Receive File Name Address Scripts	Ow24050000           RAM   SRAM1             ad File           :           :           :           :           :           :           :           :	Owned and a second seco	: 0x1000 byte	6)	Ser Rece Compare sent	nd File eive File file with mer	mory
Flash 0 Flash 1 S Flash 0 Flash 1 S Download / Uplos Send File Name Receive File Name Address Scripts Erase All Flash	0w24050000           RAM   SRAM1             ad File           :           :           :           :           :           :           :	Own 4013 000	• • • • • • • • • • • • • • • • • • •	6)	Ser Rece Compare sent	nd File sive File file with mer	mory
Flash 0 Flash 1 S Flash 0 Flash 1 S Download / Uplow Send File Name Receive File Name Address Scripts Erase All Flash Boot from Flash (6)	0w24050000 RAM   SRAM 1   ad File : [ : 0x80000 S PNVM1)	ize (For Receive File)		6)	Ser Rece Compare sent	nd File tive File file with mer	mory

13. In *Download / Upload File* next to the field for *Send File Name*, select the browse icon to locate the binary firmware file.

Start Address:         Ox20000000         Refresh         Display format         Applet traces on DBGU           Start Address:         0x20000000         0x00000000         0x00000000         0x0018034B         0x0018034D           0x20000000         0x00180333         0x0018033F         0x0018034B         0x0018034D         0x2000000           0x20000000         0x0001200         0x0018033F         0x001802B         0x001802B         0x000000           0x20000000         0x0001200         0x0000000         0x0000000         0x0000000         0x0000000           0x20000000         0x0001200         0x0000000         0x0000000         0x0000000         0x0000000           0x200000000         0x00040900         0x0000000         0x00000000         0x00000000         0x000000000           0x200000000         0x00403000         0x00000000         0x00000000         0x00000000000000000000000000000000000	at01 cam2ud Memor	Display						
Jash 0     Flash 1     SRAM 1       Download / Upload File     Send File       Send File Name :     Send File       Address : 0x80000     Size (For Receive File) : 0x1000     byte(s)       Compare sent file with memory	Start Address : 0x200 ize in byte(s) : 0x100 0x20000000 0x20000010 0x20000020 0x20000030	00000 Refrest 0x00000001 0x00180333 0x0001C200 0x00430209 0x0430209	Display forma C ascii C 8 0x0000000 0x0018033F 0x00080000 0x00000000 0x00000000 0x00000000	st 8-bit C 16-bit 0x0018034B 0x00180C1B 0x00021A1 0x00040900	<ul> <li>32-bit</li> <li>0x0018034D</li> <li>0x00180CB9</li> <li>0x00070000</li> <li>0x00070000</li> <li>0x02020100</li> <li>0x01000524</li> </ul>		Applet t	races on DBGU Apply
Receive File Name :     Receive File       Address :     0x80000     Size (For Receive File) :     0x1000     byte(s)     Compare sent file with memory       -Scripts	lach 0 ] Floor 1 ] C					/		
Address : 0x80000     Size (For Receive File) : 0x1000     byte(s)     Compare sent file with memory       Scripts	lash 0   Flash 1   S - Download / Uploa Send File Name	RAM   SRAM1   d File			-	Send	File	
Scripts Erase All Flash T Execute	lash 0   Flash 1   Si - Download / Uploa Send File Name Receive File Name	RAM   SRAM1   d File			8 8	Send Receiv	File e File	
Erase All Flash   Execute	lash 0   Flash 1   Si - Download / Uploa Send File Name Receive File Name Address	RAM   SRAM 1   d File : : : : : : : : : : : : : : : : : : :	e (For Receive File) :	0x1000 byte	2 2 2 3	Send Receiv Compare sent fil	File re File le with mem	iory
	lash 0   Flash 1   Si - Download / Uploa Send File Name Receive File Name Address - Scripts	RAM   SRAM1   d File : : : : : : : : : : : : : : : : : : :	e (For Receive File) :	0x1000 byte		Send Receiv Compare sent fil	File re File le with mem	lory



14. Find the binary firmware file located in the directory, *at88ck9000\_fw*. The name of the firmware file could change based on the version.

駵 Open					X
Look <u>i</u> n:	)) at 88ck 9000	0_fw	•	G 👂 📂 🖽 -	
æ.	Name	*		Date modified	Туре
Recent Places	國 at88ck9000	0_xxxxxx.bin		7/6/2012 3:38 PM	PowerArc
Network	•	III			Þ
INELWOIK	File <u>n</u> ame:	I.		• (	Open
	Files of type:	Bin Files (*.bin)		•	Cancel

15. Once the file has loaded, select Send File to download the new firmware.

91 sam3u4 Memory Display				
art Address : 0x20000000 F te in byte(s) : 0x100	Refresh Cascii C 8-b	it (~ 16-bit (	• 32-bit	Applet traces on DBGU
0x20000000 0x000000	01 0x0000000 0x	0018034B	0x0018034D	
0x20000010 0x001803	33 0x0018033F 0x	00180C1B	0x00180CB9	
0x20000020 0x0001C2	00 0x00080000 0x	000021A1	0x00070000	
0x20000030 0x004302	09 0xC0000102 0x	00040900	0x02020100	
0-0000040 0-040500	00 0004011000 00	05000000	0-01000624	
Download / Unload File				
Download / Upload File Send File Name : K:/Crypto/C	rypto_Programming_Board/at	88ck900_fw_sa	m 🗃	Send File
Download / Upload File Send File Name : K:/Crypto/C Receive File Name :	rypto_Programming_Board/at	88ck900_fw_sar		Send File Receive File
Download / Upload File Send File Name : K:/Crypto/C Receive File Name : Address : 0x80000	rypto_Programming_Board/at	88ck900_fw_sar	m <b>22</b>	Send File Receive File Compare sent file with memory
Download / Upload File Send File Name : K:/Crypto/C Receive File Name : Address : 0x80000 Scripts	rypto_Programming_Board/at	88ck900_fw_sai	m 🖨	Send File Receive File Compare sent file with memory
Download / Upload File Send File Name : K:/Crypto/C Receive File Name : Address : 0x80000 Scripts Erase All Flash	rypto_Programming_Board/at	88ck900_fw_sar 000 byte(s Execute		Send File Receive File Compare sent file with memory



16. Select Yes to lock the regions.



17. Verify the new firmware > select *Compare sent file with memory*.

191sam3u4 Memory	Display				
tart Address : 0x200	00000 Refresh	Display format		Applet traces on DBGU	
ze in byte(s) : 0x100		ascii C 8-bit C 16-bit (	• 32-bit	infos <u> </u>	
0x20000000	0x0000001 0	x00000000 0x0018034B	0x0018034D		
0x20000010	0x00180333 0	x0018033F 0x00180C1B	0x00180CB9		
0x20000020	0x0001C200 0	x00080000 0x000021A1	0x00070000		
0x20000030	0x00430209 0	xC0000102 0x00040900	0x02020100		
0+0000040	0+24050000 0	*04011000 0*05000224	0+01000624		*
Send File Name :	K:/Crypto/Crypto_Pro	gramming_Board/at88ck900_fw_sa	m 😂	Send File	1
	ceive File Name :			Receive File	
Receive File Name :		and the second		Compare sent file with memory	
Receive File Name : Address :	0x80000 Size (1	or Receive File) : 0x1000 byte(			
Receive File Name : Address : Scripts	0x80000 Size (1	or Receive File) :  0x1000 byte(			1
Receive File Name : Address : Scripts Erase All Flash	0x80000 Size (1	or Receive File) :  0x1000 byte(:			1

18. Be sure you get a success match, similar to the following message.



- 19. Reset the board to allow the new firmware to execute.
- 20. Congratulations. The firmware recovery or upgrade is complete.



## Maintenance of the AT88CK9000 Board

The sockets used in the AT88CK9000 kit are rated for 50,000 insertions per socket. Care must be taken to not bend or deform the leads of the socket.

If the sockets become damaged or worn, the following part numbers and suppliers should be used for replacement purchases. The sockets will need to be unsoldered and then resoldered onto the board.

Package Type	Part Number	Supplier
8-lead SOIC	216-7388-55-1902	Digikey 3M5078-ND
8-lead TSSOP	FP-8(24)-065-01A	Enplas
3-lead SOT23-3	499-P36-10	WellsCTI
8-pad UDFN	08QN50L43020	Plastronics
3-lead CONTACT	06QHCMY01-A	Plastronics

### Troubleshooting the AT88CK9000 Kit

Issue:	No Power.	
Resolution:	<ul> <li>Verify the USB cable is plugged correctly to the board, and is plugged into an approved power source.</li> <li>If the cable is plugged into the correct power source, try unplugging the cable, and then replug the cable into the AT88CK9000 board.</li> </ul>	
Issue:	One or More Sockets (Sites) Always Fail.	
Resolution:	<ul> <li>Visually inspect the socket for bent leads.</li> <li>If the leads are straight, clean the contacts on the socket.</li> <li>If the site is still failing, the socket may be worn and should be replaced.</li> </ul>	
Issue:	Board Fails to be detected by the PC for Download Mode.	
Resolution:	<ul> <li>Be sure the board is in the Download mode and is not in the Programming mode.</li> <li>Try unplugging and then replug the USB cable into the board while pushing the <i>B Select Mode</i> button on the back of the board.</li> </ul>	



# **Ordering Code Information**

Ordering Code Package		уре
AT88CK9000-8SH	8S1	8-lead JEDEC SOIC
AT88CK9000-8TH	8X	8-lead TSSOP
AT88CK9000-TSU	3TS1	3-lead SOT23-3
AT88CK9000-8MA	8MA2	8-pad UDFN
AT88CK9000-RBH	3RB	3-lead CONTACT

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ATMEL CORPORATION 1600 Technology Drive San Jose, CA 95110 USA

### **Revision History**

Doc Rev.	Date	Comments
8821C	12/2014	Removed Verify step in Putting the Board in Download Mode section.
8821B	11/2014	Added Firmware Upgrade/Recovery section, terminology changes, and RBH package support notes. Updated ordering codes, template, board/kit notice, and disclaimer page.
8821A	06/2012	Initial document release.



# Atmel Enabling Unlimited Possibilities



#### Atmel Corporation 1600 Technology Drive, San Jose, CA 95110 USA T: (+1)(408) 441.0311 F: (+1)(408) 436.4200 www.atmel.com

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