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**Atmel AT88CKECCROOT Provisioning Root Module Kit**

## Introduction

The Atmel® Root Module Utility application provides an easy and secure method to create a certificate authority for provisioning the Atmel® ECC-based CryptoAuthentication™ devices. This document describes the usage for the Atmel Root Module Utility application.

## Features

- Un-configured Root Module Flow to create customized Certificate Authority (CA)
- Configured Root Module Flow to create additional Root modules

## Table of Contents

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<b>Un-configured Root Module Flow .....</b>	<b>3</b>
Step 1      Start the Root Module Utility Application .....	3
Step 2      Insert an Un-configured Root Module .....	3
Step 3      Root Module License Agreement .....	4
Step 4      Root Module Configuration .....	5
Step 5      Root Module Advanced Configuration .....	6
Step 6      Root Module Load Backup File .....	7
Step 7      Configure Root Module .....	8
Step 8      Configure Backup Root Module .....	9
Step 9      Root Module Save Backup File .....	11
Step 10     Root Module Additional Information .....	12
<b>Configured Root Module Flow .....</b>	<b>13</b>
Step 1      Start the Root Module Utility Application .....	13
Step 2      Insert Configured Root Module .....	13
Step 3      Root Module Additional Information .....	14
<b>Atmel Evaluation Board/Kit Important Notice and Disclaimer .....</b>	<b>16</b>
<b>Revision History .....</b>	<b>16</b>



## Un-configured Root Module Flow

### Step 1 Start the Root Module Utility Application

Start the Root Module Utility application by selecting the Root Module Utility application from the following Microsoft Window Start Menu location:

- ▶ Select the **Start Menu > All Programs > Atmel Secure Products > Provisioning Kits > and then Root Module Utility.**

The **Atmel Root Module Utility** application window displays as shown below.

Figure 1. Root Module Utility Application Main Window



### Step 2 Insert an Un-configured Root Module

1. Insert an un-configured Root Module from the AT88CKECCROOT Provisioning Root Module Kit. The Root Module is read by the Root Module Utility application and the information about the Root Module is displayed on the Root Module Utility application main window.



Keep the Root Module inserted in the computer until the Root Module configuration has been completed.

2. Select **Next >** to continue to the Root Module License Agreement.

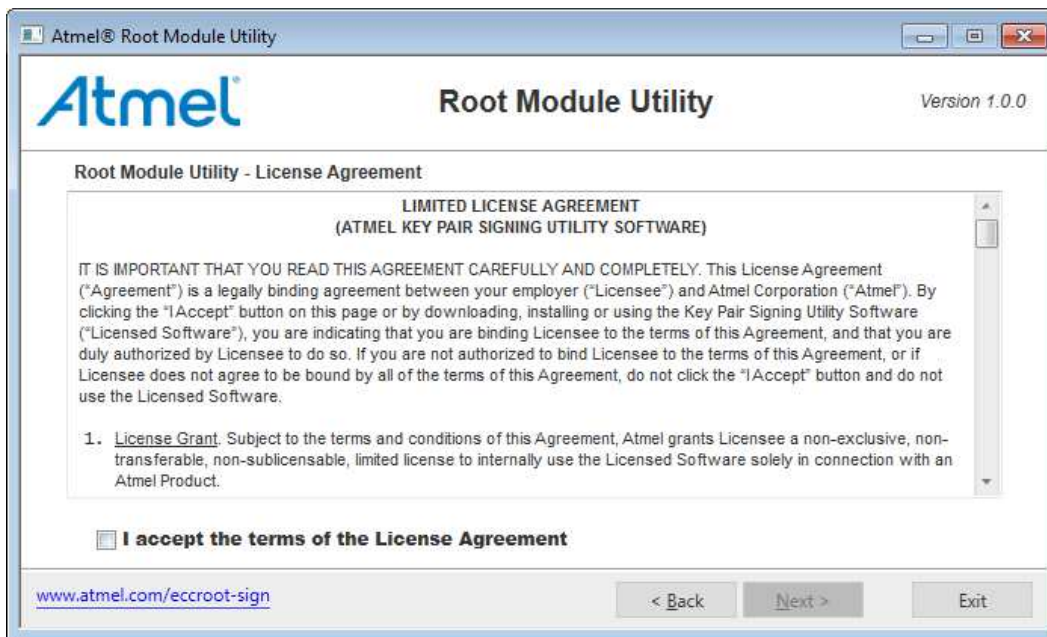
Figure 2. Sample Un-configured Root Module Main Window



### Step 3 Root Module License Agreement

1. Please read the license agreement.
2. Select the check box for ***I accept the terms of the License Agreement***
3. Select **Next >** to continue to the Root Module configuration.


Figure 3. Root Module Utility License Agreement



## Step 4 Root Module Configuration

1. Provide the Root Module configuration information as shown in the figure below.



Move the mouse cursor over the  image to display help information about the Root Module configuration information.

- **Module Description (Not Required)**
    - The description of the Root Module to be configured. Is referenced in the future.
    - Maximum length is 63 alpha-numeric characters.
  - **Organization (Required)**
    - The organization that configured the Root Module.
    - The organization is added to the Root Module's Root CA X.509 certificate.
    - Maximum length is 63 alpha-numeric characters.
  - **Certificate Common Name (Required)**
    - The Root Module certificate common name.
    - The Root Module certificate common name is required for the Root Module's Root CA X.509 certificate.
    - The Root Module certificate common name is used to uniquely identify the Root Module's Root CA X.509 certificate.
    - Maximum length is 63 alpha-numeric characters.
2. Select the **Advanced...** to open the **Root Module Utility - Advanced Configuration Information** dialog box.
  3. After entering the Root Module configuration information, select **Commit >** to configure the Root Module. See Step 7 for more information.

Figure 4. Root Module Configuration

Atmel® Root Module Utility

Atmel Root Module Utility

Version 1.0.0

Please provide the following Root Module configuration information.

**Module Description (max 63 characters):**  
Example Organization Example ATECC508A Root CA

**Organization (max 63 characters) (Required):**  
Example Organization

**Certificate Common Name (max 63 characters) (Required):**  
Example ATECC508A Root CA

Advanced...

Press the Commit button to configure the Root Module.

[www.atmel.com/eccroot-sign](http://www.atmel.com/eccroot-sign) < Back Commit > Exit

## Step 5 Root Module Advanced Configuration

Provide the following Root Module advanced configuration information.

1. Select **Load Root Module Backup File...** to load the Root Module backup file. See Step 6 for more information.



Move the mouse cursor over the image to display help information about the Root Module private key.

- **Root Module Private Key (Required)**

- Generated by using the internal high quality random number generator within the Root Module.
- Root Module private key to be securely stored within the Root Module.
- Enter or paste a new private key into the edit box.
- Maximum length is 32 hexadecimal characters.



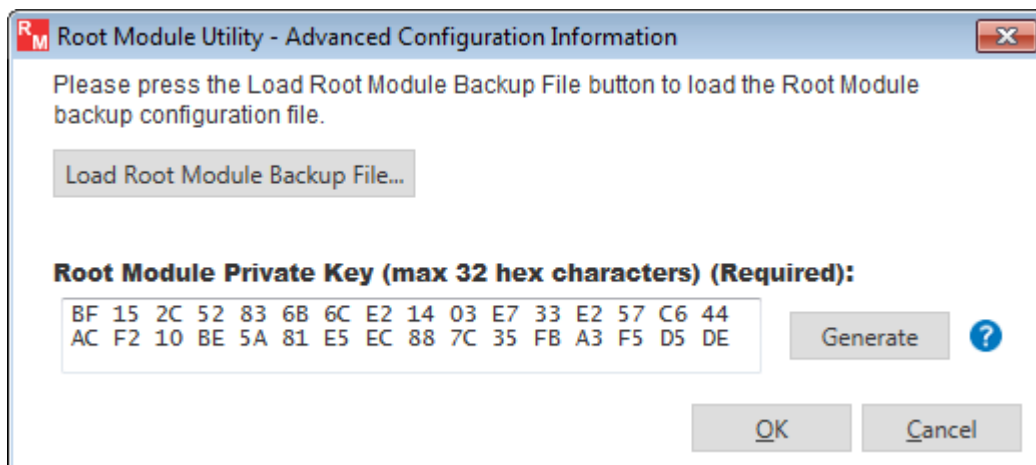
**This key is the key the entire system will be trusted to. It is the Root of Trust.**

- **Root Module Private Key Generate Button**

- Generates a new random Root Module private key.

2. Select **OK** to save any changes to the Root Module private key.

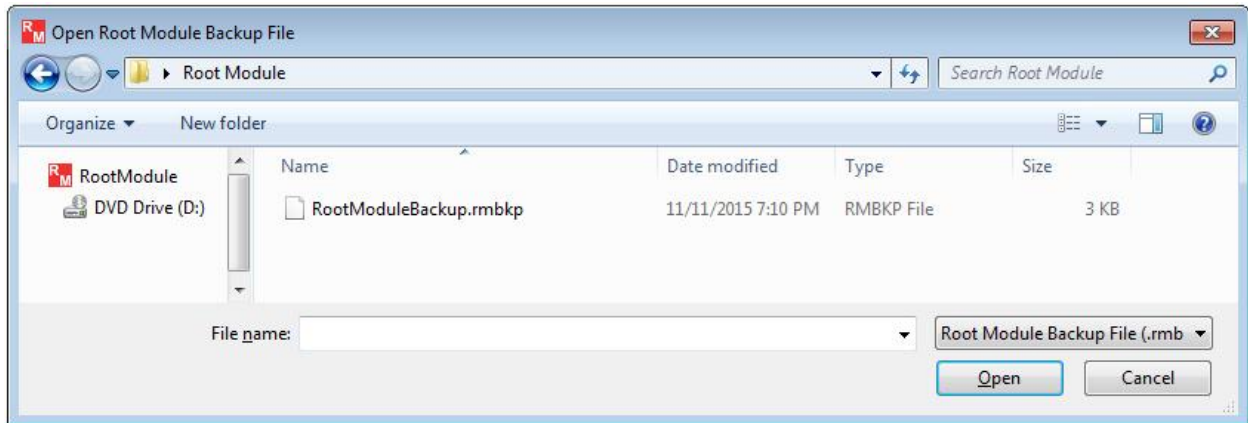
Figure 5. Root Module Advanced Configuration



## Step 6 Root Module Load Backup File

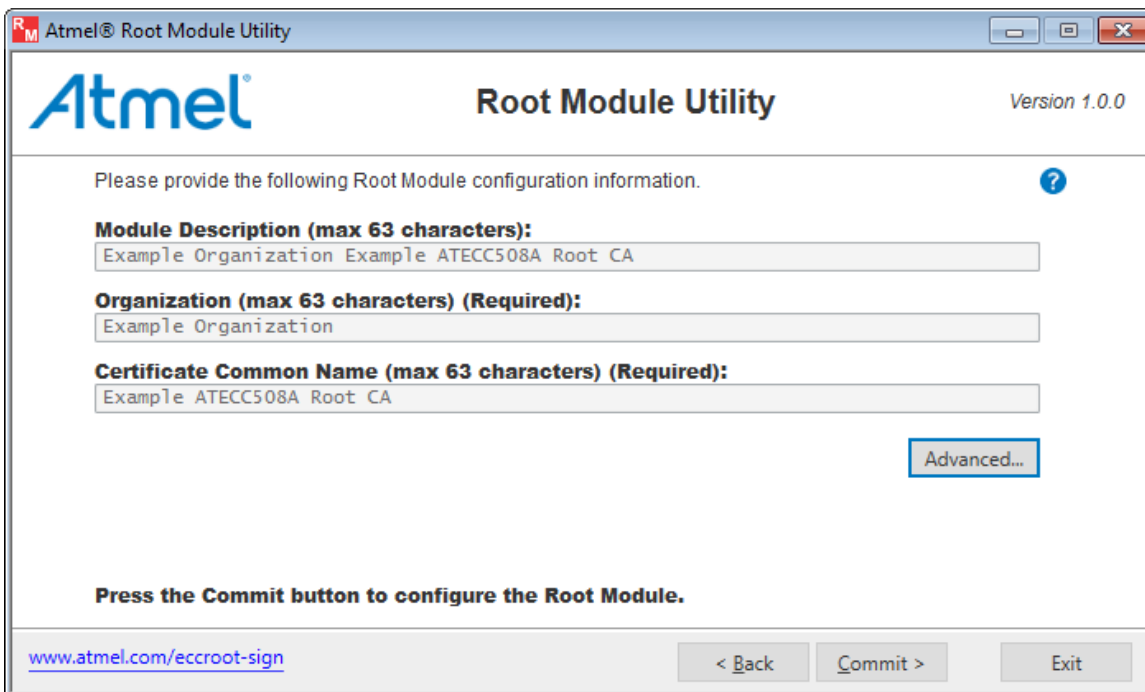
The Root Module load backup file capability is used to load a Root Module backup file to create a Root Module that is identical to the original Root Module. The original Root Module configuration process saved the backup file.

Figure 6. Example Open Root Module Load Backup File Dialog



After the Root Module load backup file has been loaded, the Root Module configuration information is loaded from the backup file, and the editable fields are disabled.

Figure 7. Example Root Module Configuration Information After The Backup File Is Loaded





## Step 7 Configure Root Module

1. After entering the Root Module configuration information select **Commit** > to configure to the Root Module. The Root Module configuration process starts.



It is very important that the configured Root Module be stored in a save place. The Root Module is the trusted certificate authority within the Atmel Secure Provisioning System. Reference the application note on Best Practices to protect this valuable device.

2. Follow the directions to configure the Root Module.

Figure 8. Root Module Configuration

The screenshot shows the 'Atmel® Root Module Utility' window, Version 1.0.0. The window title bar includes the Atmel logo and the text 'Atmel® Root Module Utility'. The main content area contains the following text and fields:

Please provide the following Root Module configuration information. ?

**Module Description (max 63 characters):**

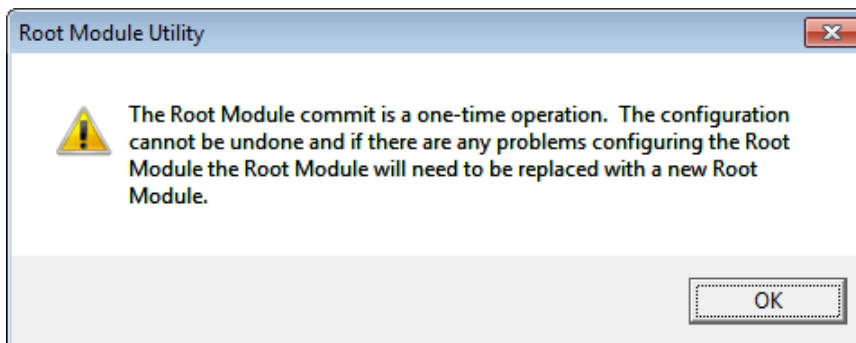
**Organization (max 63 characters) (Required):**

**Certificate Common Name (max 63 characters) (Required):**

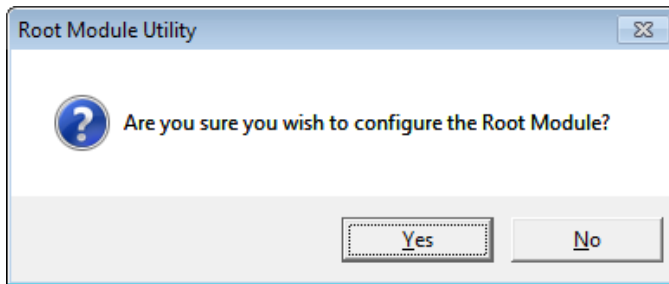
**Press the Commit button to configure the Root Module.**

At the bottom of the window, there is a footer area containing the URL [www.atmel.com/eccroot-sign](http://www.atmel.com/eccroot-sign) and three buttons: '< Back', 'Commit >', and 'Exit'.

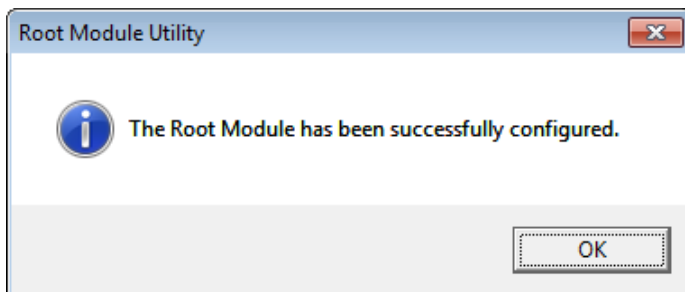
Figure 9. Root Module Configure Warning Dialog Box



**Figure 10. Root Module Configure Question Dialog Box**



**Figure 11. Root Module Successful Configuration Dialog Box**



3. After the Root Module is successfully configured, it asks to configure backup Root Modules. See Step 8 for more information.
4. After a backup Root Module is configured, it asks to save the Root Module configuration file. See Step 9 for more information.
5. After the Root Module backup file is saved, options to save additional configured Root Module information are provided. See Step 10 for more information.

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## **Step 8 Configure Backup Root Module**

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After the original Root Module is configured, the option to create up to 14 additional backup Root Modules is given. Atmel recommends creating at least two backups, for a total of three Root Modules. Please follow the directions carefully.



It is very important that the configured backup Root Modules be stored in a safe place. The Root Module is the trusted certificate authority within the Atmel Secure Provisioning System. Reference the application note on Best Practices to protect this valuable device.



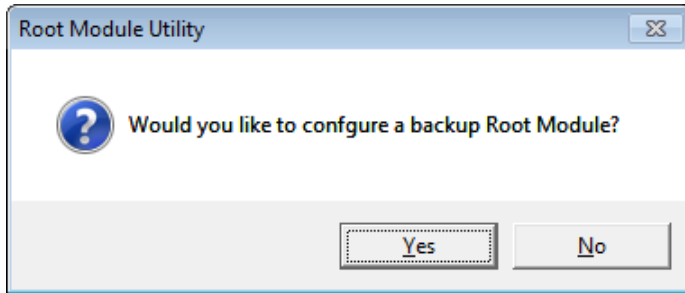
It is recommended to create a minimum of two backup Root Modules to be stored in a safe place.



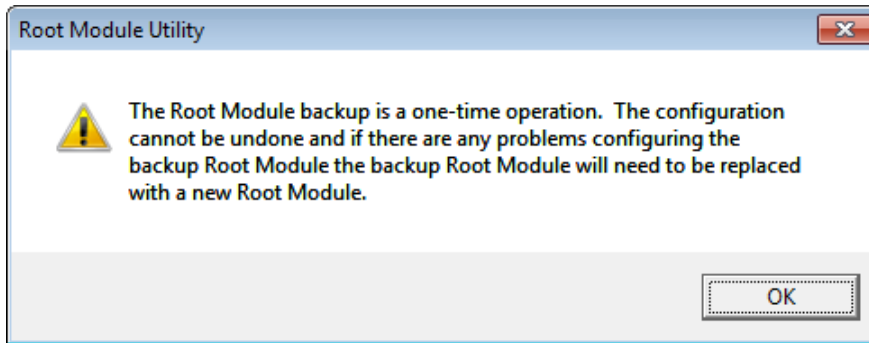
These backup Root Modules are identical to the original Root Module.

1. Start the backup Root Module configuration process.

**Figure 12. Configure Backup Root Module Question Dialog**

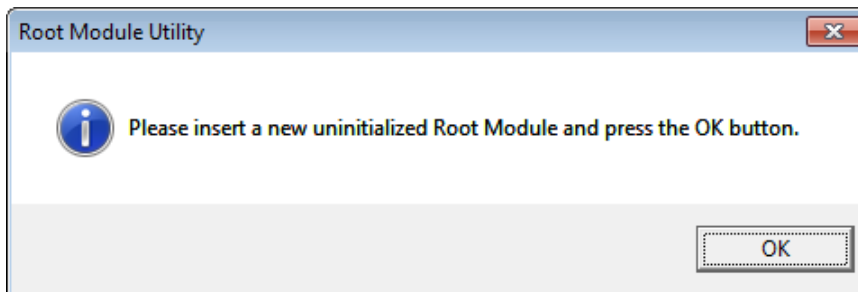


**Figure 13. Backup Root Module Configure Warning**

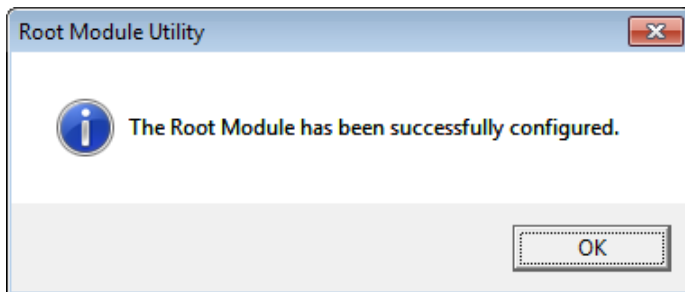


2. Insert a new un-configured Root Module before pressing the *OK* button

**Figure 14. Insert Un-configured Root Module Dialog**



**Figure 15. Root Module Successful Configuration Dialog**



3. An option to create another backup Root Module is given. When the backup Root Module process is completed, the option to save the Root Module backup file is given. See Step 9 for more information.

## Step 9 Root Module Save Backup File

The Root Module Save Backup File capability allows a backup file to be saved as a last resort recovery method for the Root Modules. This file is intended to be used to restore a Root Module should something happen to the original or backup Root Modules. It can also be used to create additional backup Root Modules.

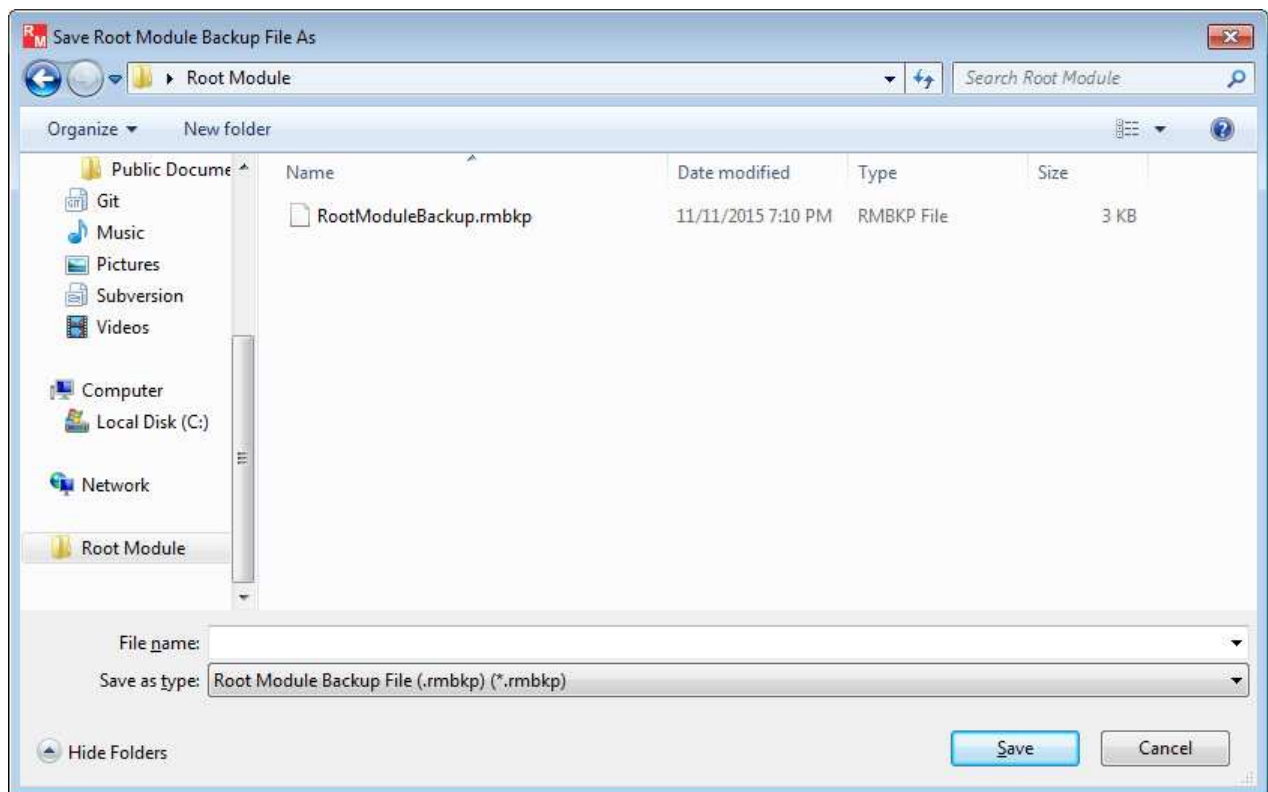


It is extremely important to save the Root Module configuration backup file. This file *cannot* be saved at a later date and time.

It is very important that the Root Module configuration file is stored in a safe place. The Root Module backup file contains sensitive information about the configuration of the Root Module. This file should not be stored on a computer, but should only exist on removable media like a USB flash drive, and that media drive secured in a safe location.

The backup file can be printed to provide a hardcopy backup. This should be kept very secure.

Figure 16. Example Save Root Module Backup File Dialog



## Step 10 Root Module Additional Information

The Root Module Additional Information window allows the previous Root Module operations to be performed again if necessary and to save the Root Module's Root CA X.509 certificate.

- **Save Root Module Backup File...** button:
  - Saves the Root Module backup file. See Step 9 for more information.
- **Save Root Module Certificate File...** button:
  - Saves the Root Module Root CA X.509 certificate file. This certificate file is used to verify that a Signer Module (from the AT88CKECCSIGNER Kit) is signed by this Root Module.
- **Create Backup Root Module...** button:
  - Starts the process to create backup Root Modules. See Step 8 for more information.

Figure 17. Root Module Additional Information

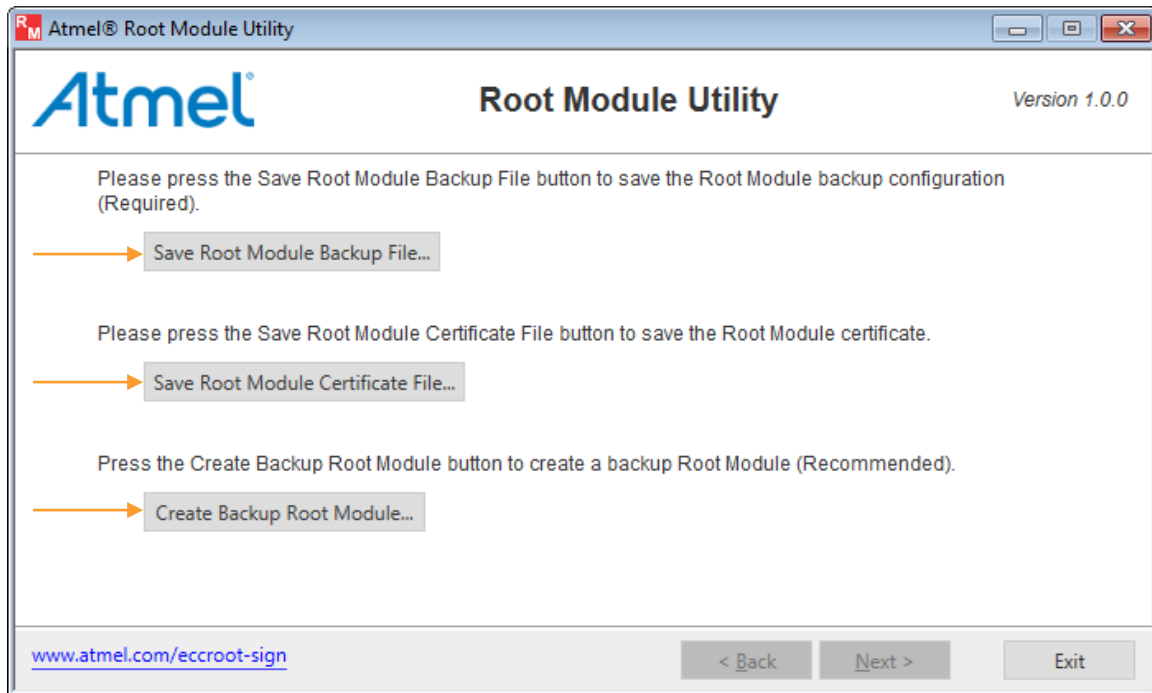
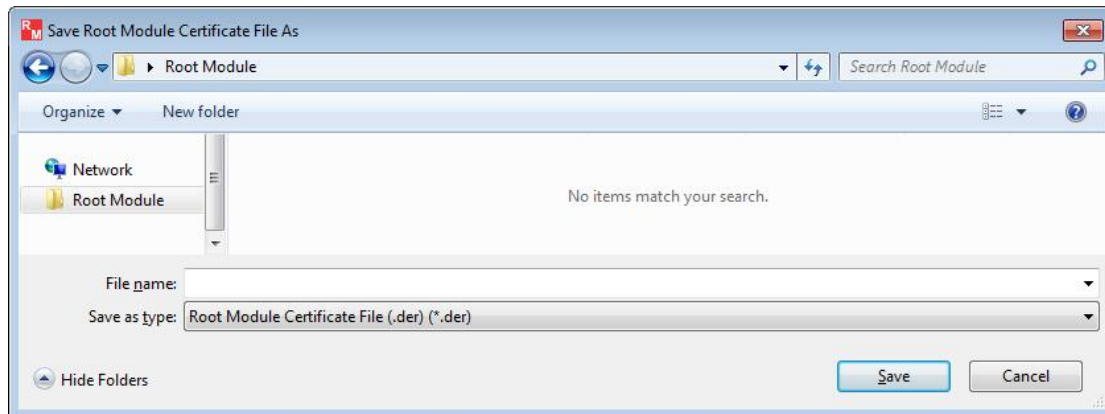


Figure 18. Example Save Root Module Certificate File



Note: This certificate file can verify that a Signer Module (from the AT88CKECCSIGNER kit) is signed by this Root Module.



## Configured Root Module Flow

This section is to be used if a Root Module has already been created and want to view and/or save information about it.

### Step 1 Start the Root Module Utility Application

Start the Root Module Utility application by selecting the Root Module Utility application from the Microsoft Window Start Menu location:

- ▶ Select the **Start Menu > All Programs > Atmel Secure Products > Provisioning Kits > and then Root Module Utility.**

The **Atmel Root Module Utility** window displays:

Figure 19. **Root Module Utility Application Main Window**



### Step 2 Insert Configured Root Module

1. Insert a configured Root Module from the AT88CKECCROOT Kit.

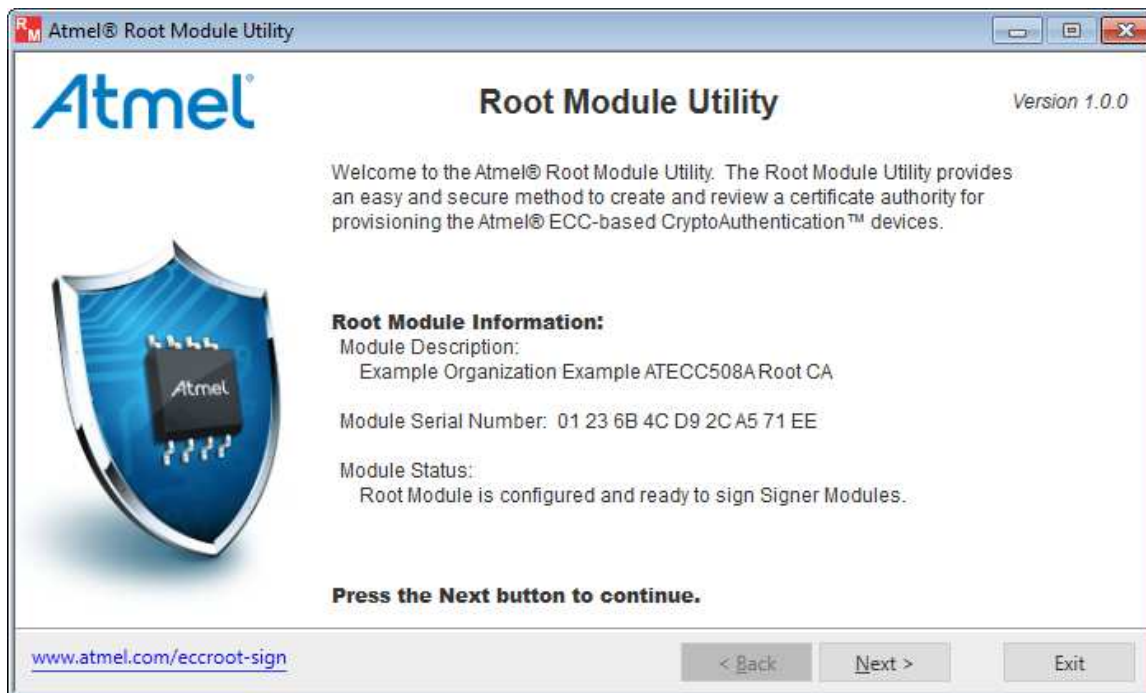
The Root Module is read by the Root Module Utility application, and information about the Root Module is displayed on the Root Module Utility application main window.



Keep the Root Module inserted in the computer until the Root Module configuration has been completed.

2. Select the **Next >** button to continue to the additional configured Root Module information.

Figure 20. Sample Configured Root Module Main Window



### Step 3 Root Module Additional Information

The configured Root Module Additional Information window allows the Root Module Root CA X.509 certificate to be saved and the Root Module signer log can be viewed.

- **Save Root Module Certificate File...** button:
  - Saves the Root Module's Root CA X.509 certificate file. This file is to verify that a Signer Module (from the AT88CKECCSIGNER Kit) is signed by this Root Module.
  - The certificate is a standard X.509 DER format.
- **Root Module Signer Log Entries:** field:
  - Displays a list containing the times a Signer Module was signed by this Root Module and the associated Signer Module public key.

Figure 21. The Configured Root Module Additional Information Dialog

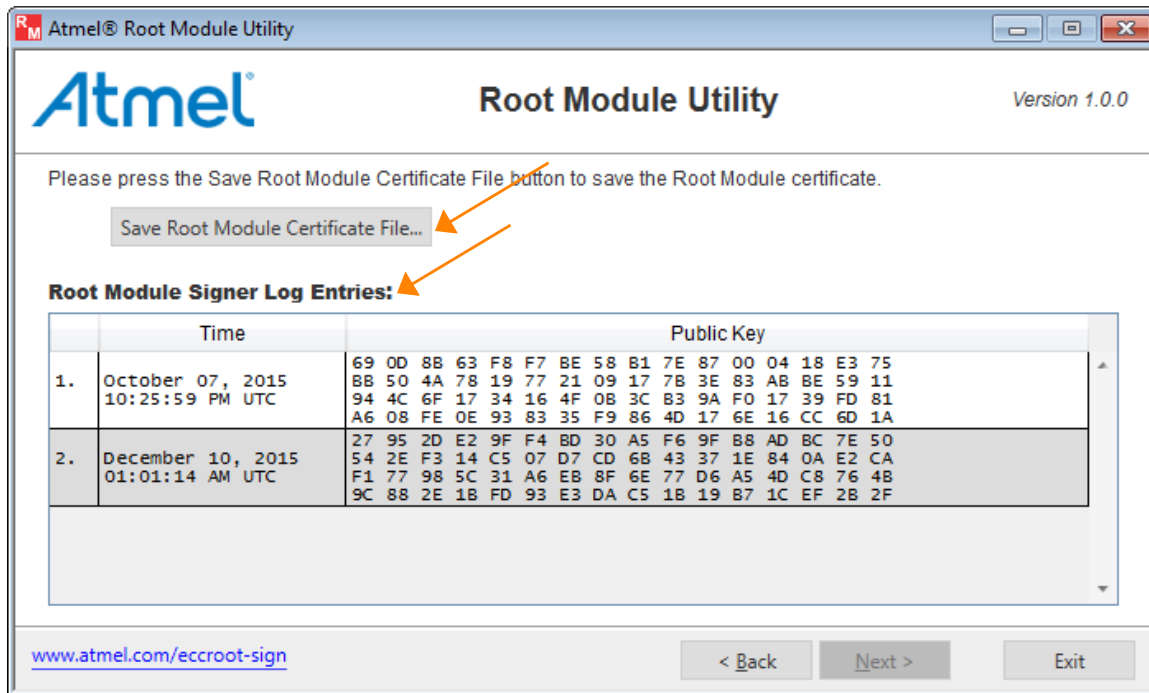
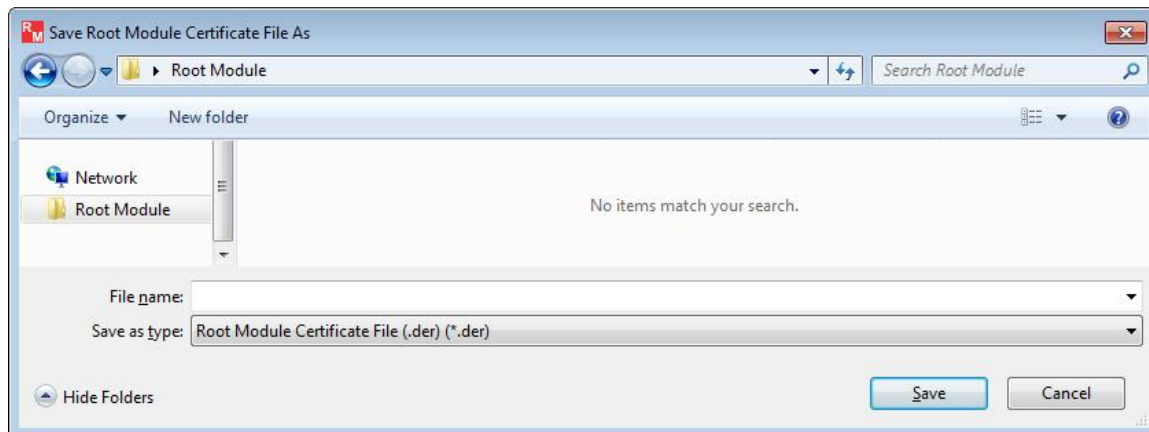


Figure 22. Example Save Root Module Certificate File Dialog



Note: This certificate file can verify that a Signer Module (from the AT88CKECCSIGNER kit) is signed by this Root Module.

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## Revision History

Doc Rev.	Date	Comments
8967A	12/2015	Initial document release.

