Atmel

Application Note

Atmel Smart Upgrade Tool v1.0

USER MANUAL

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1   Introduction

Atmel Smart Upgrade tool is a comprehensive application that provides easy upgrading of the firmware for easy and quick OTAU environment to the customer.

This user guide provides how to use this tool effectively to make use of the firmware upgrade of the Atmel devices.

2   Scope

It shows you how to perform firmware upgrading of Smart Connect 6LOWPAN stack.

3   Installing Atmel Smart Upgrade Tool

Start the installation by double-clicking the Atmel Smart Upgrade tool setup (msi) file.

3.1   System Requirements

- Server node for each target system
- Windows 7/8
- 512 MB or better RAM
- 500 MB available disk space
- Dot Net framework 4.5

4   Working on Smart Upgrade Tool

The Tool will first connect to the device called server through any communication medium.

Once the tool establishes the communication with server, it starts communicating with the clients over the air.

- Clients
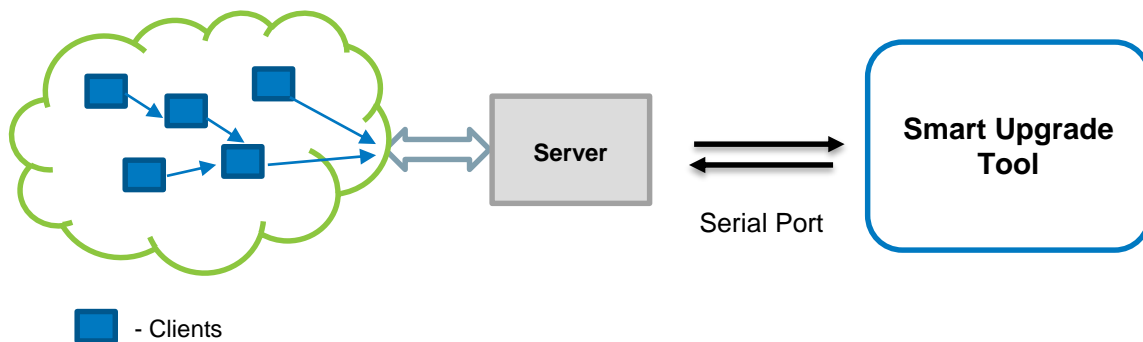
Figure 1 : Overview

Above figure gives the whole picture about the upgrade tool architecture.

ℹ️ **INFO**   **In this version, the tool communicates only via serial port to the server node.**

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4.1 Opening the Smart Upgrade Tool

Once the installation is finished, you can see the shortcut created on your Desktop. Double click and open the Smart Upgrade tool now.
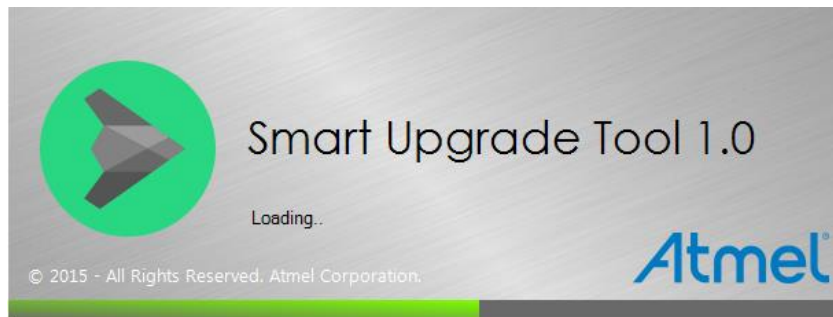

Figure 2 Opening Smart Upgrade Tool

4.2 Starting the Session

This section explains about how to start the session using this tool. Once the application is opened, go to Settings menu and Select Connection.
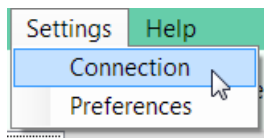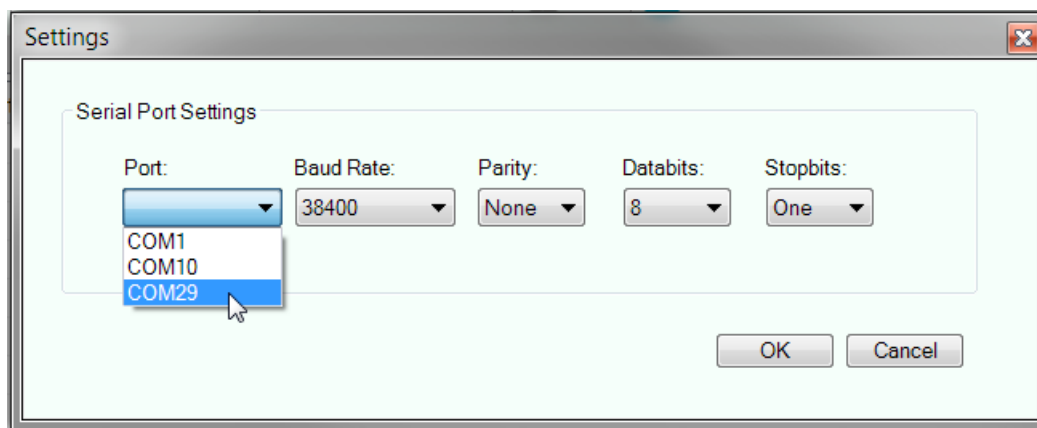

Figure 3 Connection Settings

Figure 4 Configuring the Serial Port

- Select the desired COM port and click OK to save the settings.
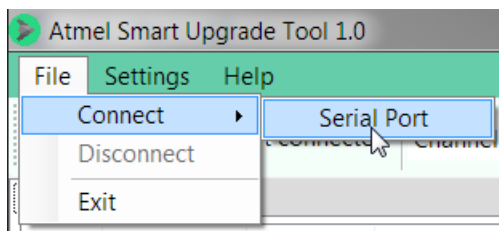
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Figure 5 Connecting the Server

- Now Go File-> Connect -> Serial Port.
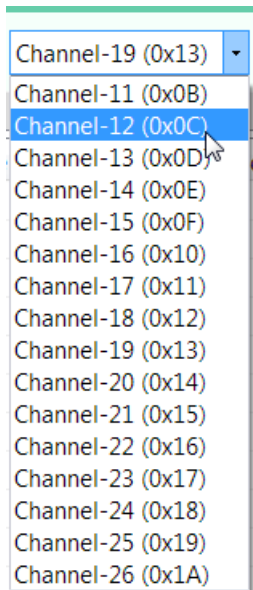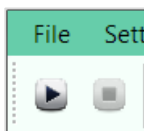- Select the desired Channel number from the drop down box available.

Figure 6 Setting the Channel number

- After selecting, Click **Start** to start the session

- Click **Stop** to stop the session at any time (even at the middle of the upgrade session).

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Once the session is started, we have to notify the server initially to discover all the clients at the selected channel by clicking the Notify Interval button at the tool bar. By default all clients will notify the server for every 5 seconds. This can be changed at any time after starting the session.
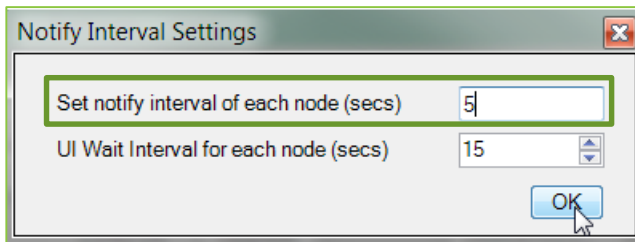

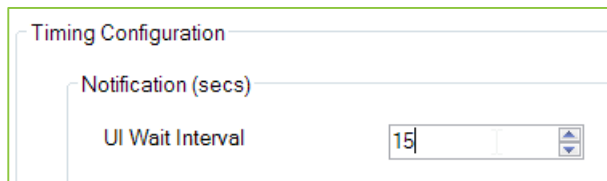**Figure 7 Notify Interval Settings for the Client**

Figure 8 UI Wait Interval for deciding a node's state

Also, the user should set the minimum wait time for the tool to decide a node whether it's active or not using **UI Wait Interval** settings from **Preferences** window.

 TIP　　　　　　　User should manage to set the timing accordingly at UI Wait Interval based on Notify Interval Settings from Main Window

By default, the timing is configured as.,
Notify Interval for Client　　　　= 5 seconds
UI Wait Interval for Tool　　　　= 15 seconds

So, The tool waits for 15 seconds which is 3 times the client notify　　in-terval setting to decide a node as ACTIVE or not.
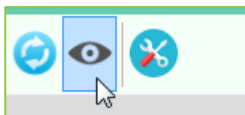
Figure 9 identifying all the Clients using Identify All button

At any time, we can use the **Identify All** button to blink all the Nodes connected to the network. This eventually blinks by toggling its chip LED.

4.3   Environment

The tool environment is composed with two panes horizontal to each other. The top pane is Table View and the bottom one is Output.
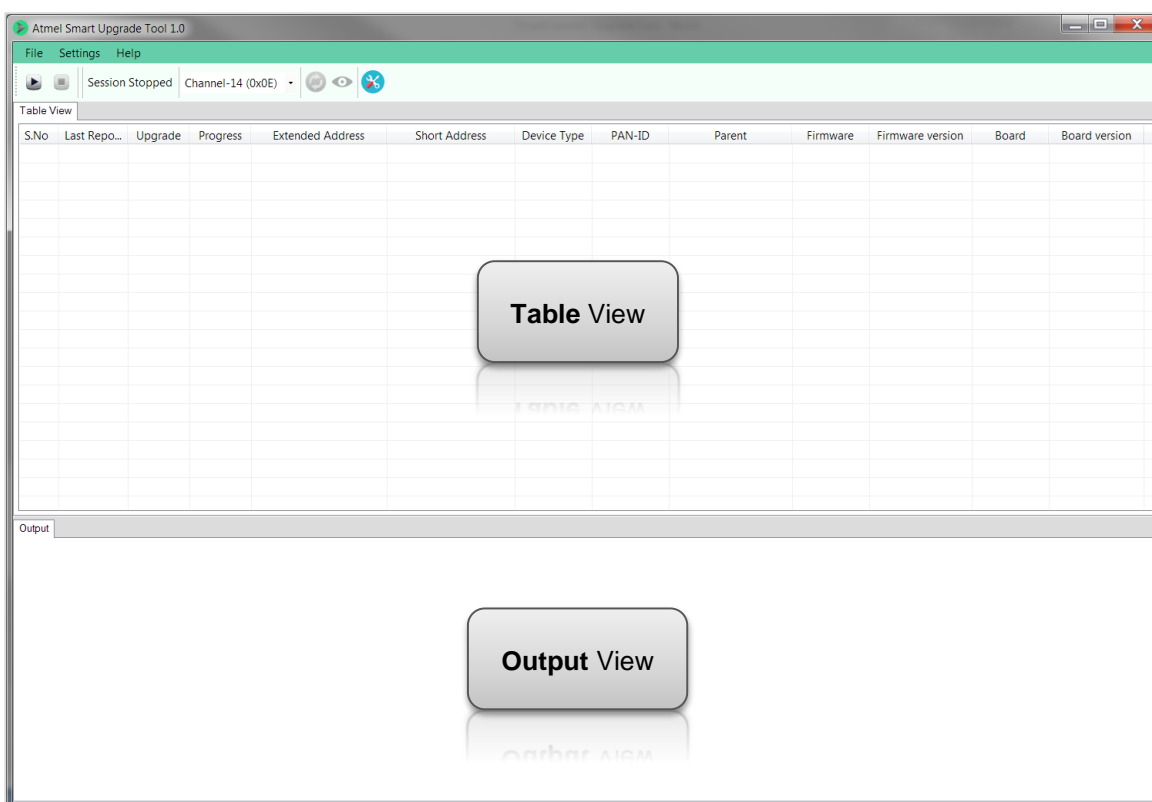
- Table View
- Output

Figure 10 Full picture of Smart Upgrade Tool

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4.3.1 Table View

The Table view will list down all the nodes that are connected to the network once the session is started. It holds useful information about the node. Each node occupies a row with several columns as described below:

Figure 11 Table View

User can easily upgrade the node using the button provided and it will show the live progress in the progress bar as like below figure.

Figure 12 Upgrade button

The remaining columns explains more about the node's detailed information.

Figure 13 Table columns explaining Node's detail

When any node goes IDLE or Not-Responding state, the Short-Address column will turn in to Red color to indicate its state.

Figure 14 Idle state indication at Table

4.3.2 Output View

This view is used to understand all the activities happening in the tool. It logs all the information that the user requested and provides the status or progress about it. All the success / failure messages can be seen in this view.


```
Output
16:22:33 : Connected to Serial port COM29 38400 successfully
16:22:39 : Started collecting data..
16:22:39 : Getting server information...
16:22:39 : Server : 0xBE87011819250402 has responded.
16:22:39 : Waiting for the client nodes..
16:22:39 : Please wait...
16:22:46 : Node : 0x598C011819250402 has joined the network
```

Figure 15 Output View

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4.4   Upgrading the Nodes

To upgrade a node, Follow the below steps.

- First the tool should know what is the firmware version is currently running on the node. So, user should right-click on the node and should first get the information like below.
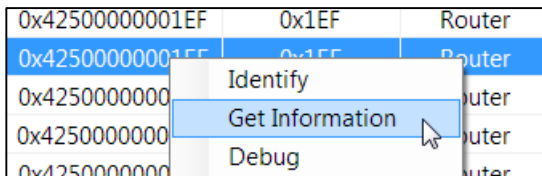

Figure 16 Getting the Firmware and Board information

- Then the server node will ask the client node about its version details and populates it on the respective columns.
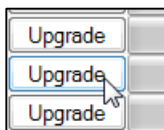- Now, Click the Upgrade button of the corresponding node.

Figure 17 Doing Upgrade on the respective node

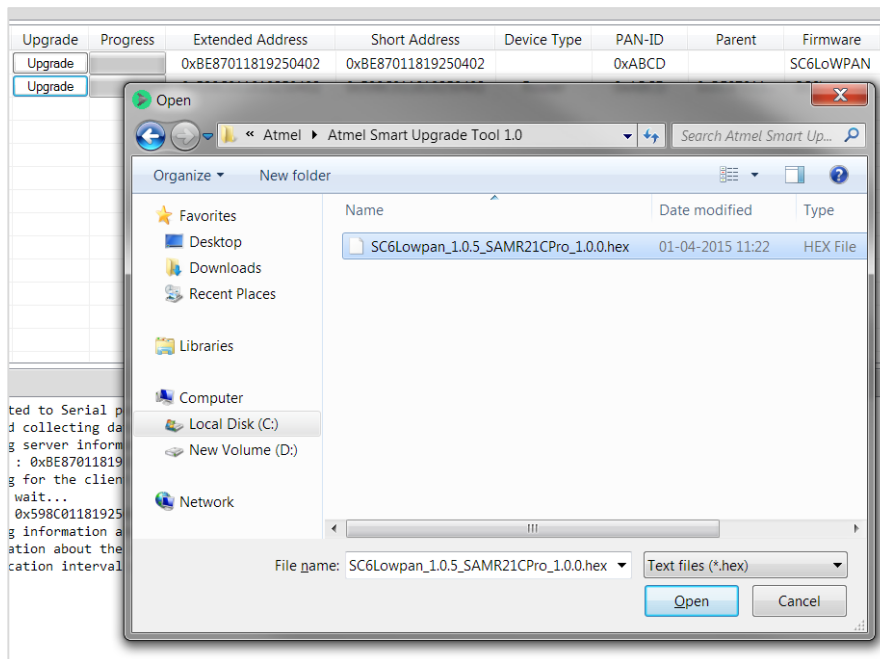- Select the image file from the dialog box that appears immediately.

Figure 18 Selecting the HEX file

Please follow the file name format as shown in the above figure. It should be like.

<FirmwareName>_<FirmwareVersion>_<BoardName>_<BoardVersion>

in this case, we have
SC6Lowpan_1.0.5_SAMR21CPro_1.0.0**.hex**
only hex files are acceptable.

- Click Open now. The upgrade will begin and progress bar will start increasing once the client receives the hex file data.
- The upgrade data will be sent to the client for every 1000 milliseconds by default. If we want to modify this interval, Open **Preferences** from **Settings** menu and change the *Client Response Interval*.

Figure 19 Setting the Client Response Interval for Upgrade

- If we did not received any response from the client then the tool will stop the upgrade process after the certain period of time. This can configured again from the same Preferences window, *UI Wait Interval* value at the Upgrade section.
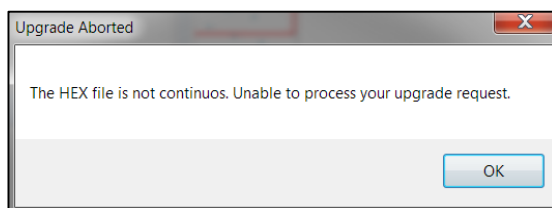

Figure 20 Setting the UI Wait Interval for Upgrade

TO DO

If we encounter this below message box,

Upgrade Aborted

The HEX file is not continuos. Unable to process your upgrade request.

OK

Then it indicates it has record type 4 or 5.

User should modify the hex file so that the file has 0, 1, 2 and 3 record type. The tool only allows above record types only.

For more information about IntelHex file format.
http://en.wikipedia.org/wiki/Intel_HEX

- Once the full image sent to the client, it will be ready to switch the image as per the new image file. The user can switch to the new image whenever wanted.

Upgrade
Switch
Upgrade

Figure 21 Switching to new image

- If we click switch, then the client write into its flash memory and restarts as per the new image file selected during this process.

- Once it is successfully switched, then we will get a notification about the status like below figure.
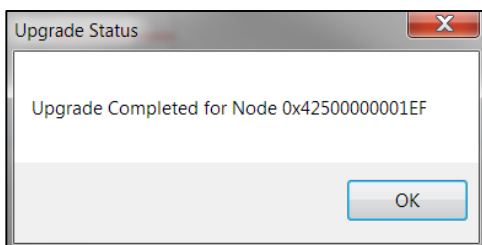

Upgrade Status

Upgrade Completed for Node 0x42500000001EF

OK

Figure 22 Upgrade completed status window

- Now the upgrade is completed.

4.5   Stopping the Session

A session can be stopped any time even if the upgrade is running at the background. It basically clears all the operation of the tool and clears the table.

4.6   Exiting the Application

Click File-> Disconnect will close the serial port.

Then Click File-> Exit (Alt+F4) to exit the application completely.

Reference

1. Atmel Wireless MCU Software Website http://www.atmel.com/products/microcontrollers/wireless/default.aspx?tab=tools

2. Atmel Wireless Support avr@atmel.com

3. IEEE Std 802.15.4™-2006 Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless Personal Area Networks (WPANs)

4. Atmel documents for supported families and boards : asf.atmel.com/docs/latest

5. Atmel Software Framework http://www.atmel.com/tools/avrsoftwareframework.aspx http://asf.atmel.com/docs/latest/

6. Atmel Studio - http://www.atmel.com/tools/ATMELSTUDIO.aspx

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