



# **SG901-1203 Firmware Update Procedure**

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## Overview

The software update process for the SG901-1203 and SG901-1203 EVK involves the following main steps:

1. Obtain files and tools
2. Establish and verify a connection to the module serial port
3. Assert the module BOOT0 pin
4. Reset the module
5. Download the new software image via the serial port
6. De-assert the module BOOT0 pin
7. Reset the module

The sections below provide details on each of these steps.



## Useful Tools

The following software tools are useful when working with the SG901-1203 and SG901-1203 EVK:

- TeraTerm (Windows) : Terminal emulation software
- Minicom (Linux) : Terminal emulation software
- CP210x USB Serial Bridge Driver (Windows) : Device driver for the USB Serial Bridge chip on the SG901-1203 EVK board

All of the Windows items are available for download from the Sagrad web site.

The Linux items are included with most Linux distributions.

## Software Update Package

The software update package (part no. SG915-0001) contains several files:

- |                           |                                  |
|---------------------------|----------------------------------|
| 1. 1203-<revtag>.bin      | Firmware file                    |
| 2. boot-1203-<revtag>.bin | Bootloader file (optional)       |
| 3. 1203flash.exe          | Windows downloader               |
| 4. stm32flash.tar.gz      | Source code for Linux downloader |
| 5. freertos-gpl.tar.gz    | Source code for GPL components   |

The firmware file is the binary firmware for the SG901-1203 module. The file will be downloaded to the module using the downloader program.

The Windows downloader is a pre-compiled binary (built from the same sources as the Linux downloader).

The source code for the downloader is included and relatively easy to build on Linux hosts.

The GPL component source code is included in this package to meet the requirements of the GPL license.

## Establish a Connection

To perform the firmware update requires that the host computer have a good serial connection to the console port (S1) on the SG901-1203. For more details, see the SG901-1203 EVK Users Guide and the SG901-1203 datasheet.

The serial parameters are: 115200 8N1 no-flow-control

You will need to determine which serial port the module is connected to (Windows: "COM<n>", Linux: "/dev/ttyS<n>" or "/dev/ttyUSB<n>") and save that for use in the "Download" step



## Assert the module BOOT0 pin

To place the module in “firmware download” mode, the BOOT0 pin needs to be pulled high (3.3v). On the SG901-1203 EVK, this is accomplished by installing the jumper on J4. It is recommended that some means to assert BOOT0 be included in any customer design using the SG901-1203 module.

Note that, while the BOOT0 pin is asserted, the module will always reset to firmware download mode and will not perform its normal functions. To return to normal operation the BOOT0 pin must be de-asserted.

## Reset the module

To enter “firmware download” mode, the module must be reset. This can be done by cycling the power or by asserting/deasserting the reset pin. On the SG901-1203 EVK this can be done by pressing the button SW1.

## Download new software

The software downloader application is a command line program that is included in the firmware update package. To download the new software:

1. Reset to “firmware download” mode (EVK LED should not be on or blinking)
2. Run the command:
  - a) (Windows): 1203flash.exe -b 115200 -w 1203-<revtag>.bin COM<n>:
  - b) (Linux): ./1203flash -b 115200 -w 1203-<revtag>.bin /dev/tty<serialport>
3. After the download is complete, the application firmware is started and (on the EVK) the LED will start to blink.

## Download new bootloader

The bootloader is updated via a similar procedure to the firmware:

1. Reset to “firmware download” mode (EVK LED should not be on or blinking)
2. Run the command:
  - a) (Windows): 1203flash.exe -b 115200 -x -w 1203-<revtag>.bin COM<n>:
  - b) Linux): ./1203flash -b 115200 -x -w 1203-<revtag>.bin /dev/tty<serialport>
3. After the download is complete, the application firmware is started and (on the EVK) the LED will start to blink.



## **De-assert the module BOOT0 pin**

To bring up the module in normal mode (application software running) the BOOT0 pin must be de-asserted. The module contains a pull-down resistor for this signal so just removing the 3.3v is sufficient.

## **Reset the module**

Either assert/de-assert the reset pin or power cycle the module. It will now be running with the new firmware image. To verify the correct software image, use the AT+S.STS command and look at the **version** variable, it should match the <revtag> portion of the release filename.



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