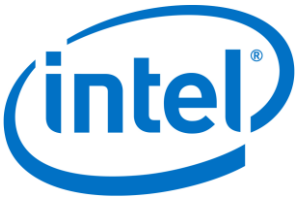

Intel® Galileo Firmware Updater Tool

User Guide

March 2015

Revision 001

Document Number: 332076-001

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Revision History

Revision	Description	Date
001	Initial release	March 3, 2015

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1 Introduction

This document describes how to use the Intel® Galileo Firmware Updater application to update the firmware on Intel® Galileo and Intel® Galileo Gen 2 boards.

The Intel® Galileo Firmware Updater tool is a standalone application used to update Intel® Galileo's firmware on Windows*, Linux* and Mac OS X*. With this tool, you can update Intel® Galileo and Intel® Galileo Gen 2 boards with the official Intel firmware that comes embedded in the application or with your own custom firmware.

1.1 References

Reference	Name	Location
332076	Intel® Galileo Firmware Updater User Guide	This document
N/A	Linux CDC-ACM Inf file	*http://downloadmirror.intel.com/24748/eng/IntelGalileoWindowsSerialDrivers.zip*

1.2 Terminology

Term	Definition
CDC	Communications device class
ACM	Abstract control model
INF	Windows setup information file
USB	Universal serial bus

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2 Installing the Firmware Updater Tool

The following steps must be followed in order to use the Intel® Galileo Firmware Updater tool with Intel® Galileo or Intel® Galileo Gen 2 boards.

2.1 Download the software

Download the Intel® Galileo Firmware Updater tool from *http://downloadcenter.intel.com/download/24748*, and if you are a Windows* user, the *linux-cdc-acm.inf* file from the *IntelGalileoFirmwareUpdater-1.0.4-Windows.zip* file on the same webpage, then place both in a folder of your preference. You will also need to download and install onto the host computer Java Runtime Environment v6 or newer, or Java Enterprise Edition 6 SDK or newer.

2.2 Prepare your Intel® Galileo boards

Before starting, do the following:

- Remove the power supply.
- Remove any USB cable connected to the board.
- Remove the SD card if there is one from the SD card slot.

Removing the SD card is necessary because it is not possible to update the firmware when the board boots from an image stored in the SD card or if there is some sketch running.

2.3 Connect to your Intel® Galileo boards

Connect the Intel® Galileo board to the computer with the following procedure:

- Always connect the power supply (1) before the USB cable on USB client port (2) as shown in Figure 1 and Figure 2 to avoid hardware damage. The USB client port is the micro USB connector closest to the Ethernet port.
- Always keep the power supply connected the Intel® Galileo board when transferring sketches or updating the firmware of your board.

Figure 1 Connect the power supply before the USB data cable on Intel Galileo

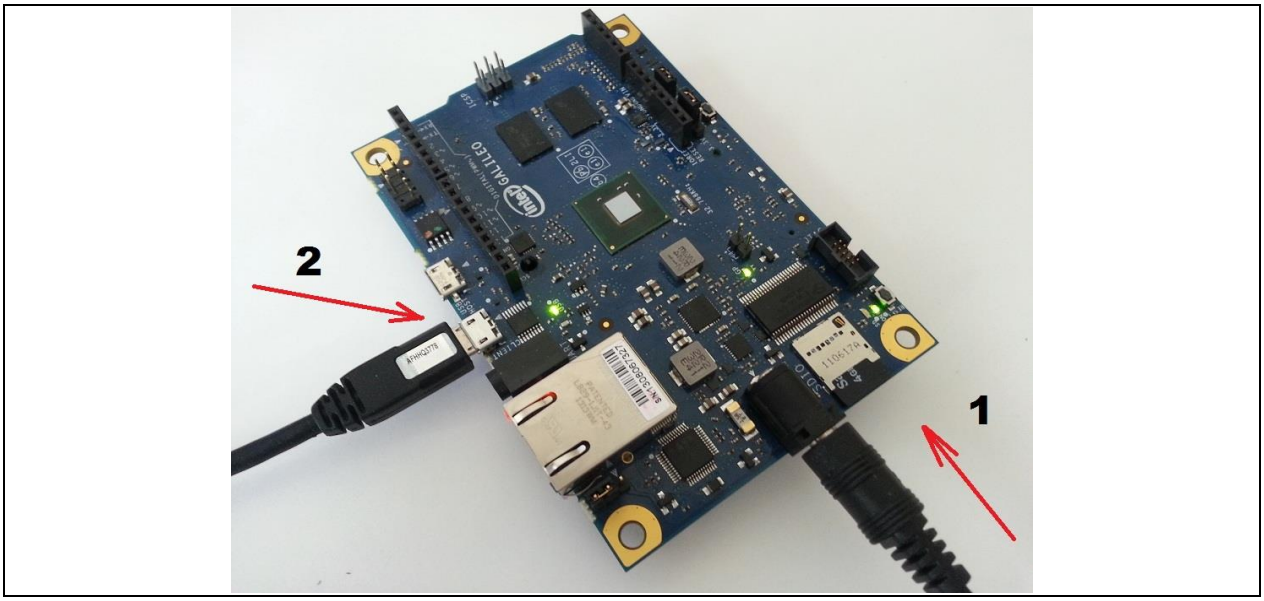
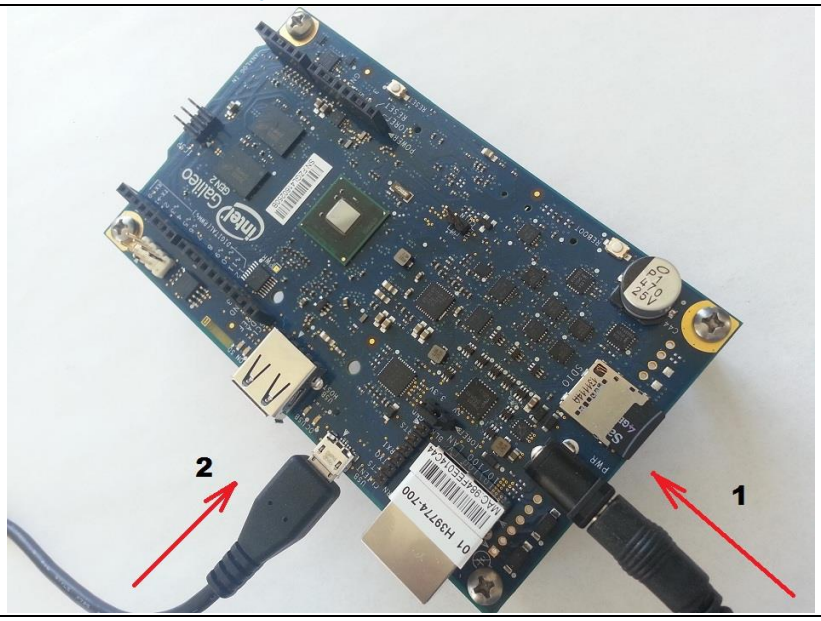


Figure 2 Connect the power supply before the USB data cable on Intel Galileo Gen 2



Note: For more information regarding USB ports, refer to the *Intel® Galileo Board User Guide* at: *http://www.intel.com/support/galileo/sb/CS-035225.htm*.

2.4 Install the drivers

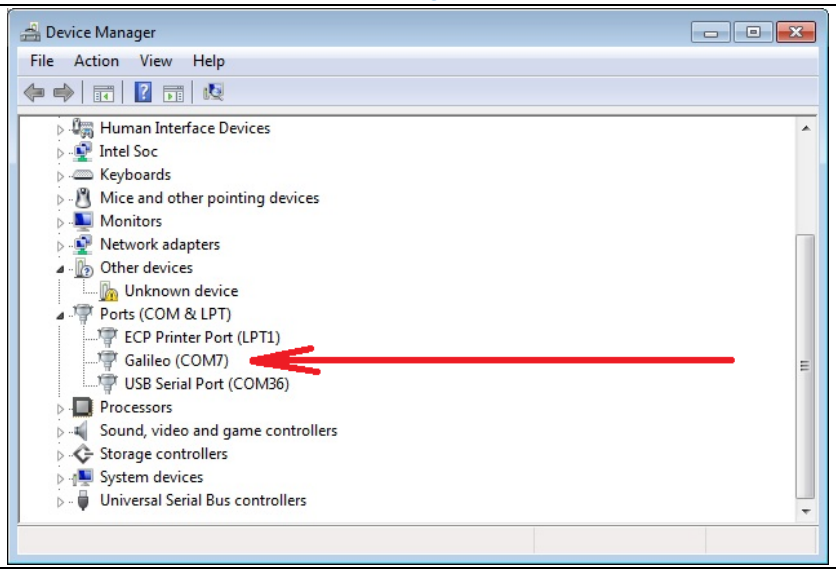
Before you can use the Intel® Galileo Firmware Updater tool, make sure your host machine has the serial drivers that will allow the Intel® Galileo Firmware Updater tool to communicate with Intel® Galileo boards. If you have already used the Intel® Galileo board successfully with Arduino* IDE, then you already have the drivers installed and you can skip this step. Otherwise, install the serial ports and drivers for your operating system following the steps in this section.

2.4.1 Windows*

To install the drivers on Windows*, do the following:

1. Connect the power and USB cables, wait 10 seconds, then open the device manager. (From the *Start* menu, open up the Control Panel and select *System and Security* on Win7. Device Manager is in the *System* group.
2. In *Ports (COM & LPT)*, you should see an open port named *Gadget Serial V2.4* if the board contains an old release like v0.7.5 or simply *Galileo* on newer releases.
3. Right-click on the *Gadget Serial V2.4* or *Galileo* port and choose the *Update Driver Software* option.
4. Select *Browse my computer for driver software*.
5. Navigate to the location where you downloaded the *linux-cdc-acm.inf* file and select it.
6. Once the driver is successfully installed, the Device Manager will show a *Galileo (COMx)* device under *Ports (COM & LPT)*, as shown in Figure 3.

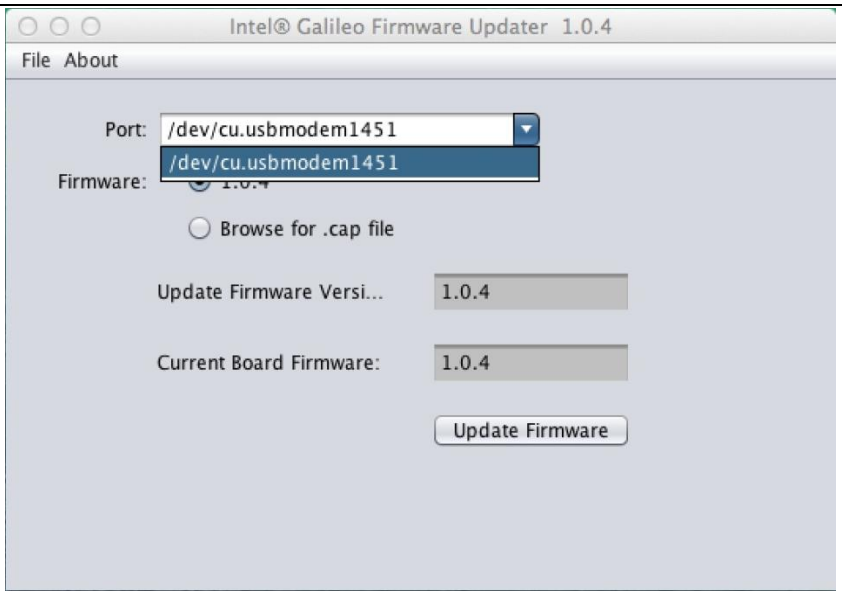
Figure 3 Intel® Galileo serial port in Device Manager



2.4.2 Mac OS X*

You do not need to install the drivers on Mac OS X*; you just need to select the correct serial port, which is represented like */dev/cu.usbmodemXXXX* where *XXXX* is a number assigned to the serial port, as shown in Figure 4.

Figure 4 Serial port selection on Mac OS X*



2.4.3 Linux*

To install the drivers on Linux*, do the following:

1. Check if an ACM port is available. Open a terminal shell (on Ubuntu, press *Ctrl+Shift+T*), then enter:

```
ls /dev/ttyACM*
```

   You should be able to see at least one serial port like ttyACM0 or some other ttyACM*x*, where *x* is an integer.

2. If you do not see a serial port, create a file */etc/udev/rules.d/50-arduino.rules* and add the following:

```
KERNEL=="ttyACM[0-9]*", MODE="0666"
```

3. Restart the *udev* service:

```
sudo service udev restart
```

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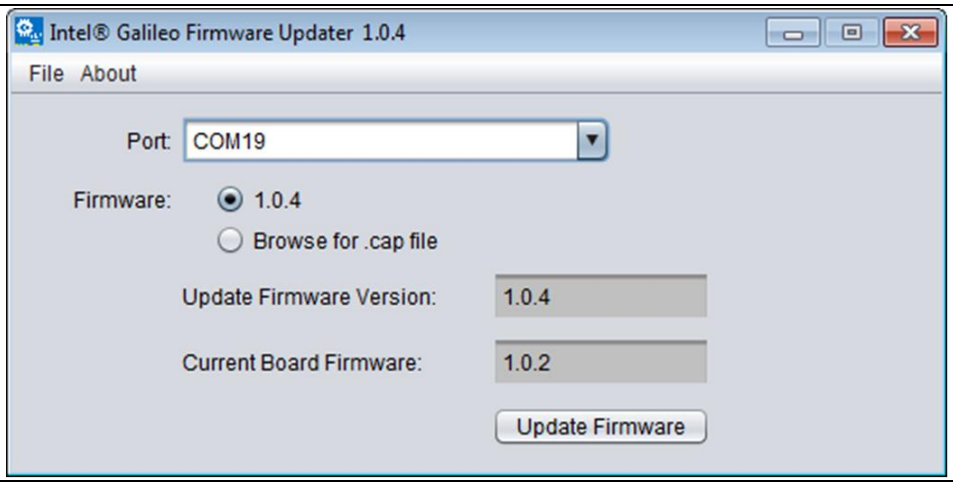
3 Updating the firmware

Run the firmware-updater software you downloaded in section 2.1, and select the serial port that is connected to the Intel® Galileo board using the combo dropdown box labeled *Port* (Figure 5). If the right serial board is selected, *Current Board Firmware* shows the current firmware version installed on the board.

For *Firmware*, select the upper radio button for the embedded firmware present in the application tool (in this case 1.0.4), or select the *Browse for .cap file* button and browse for a different capsule file on your computer.

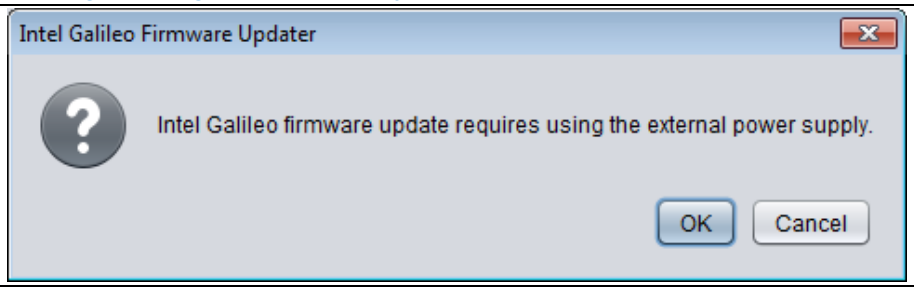
Once the capsule file and serial port are set, click *Update Firmware* to start the update process.

Figure 5 The window of Intel® Galileo Firmware Updater tool



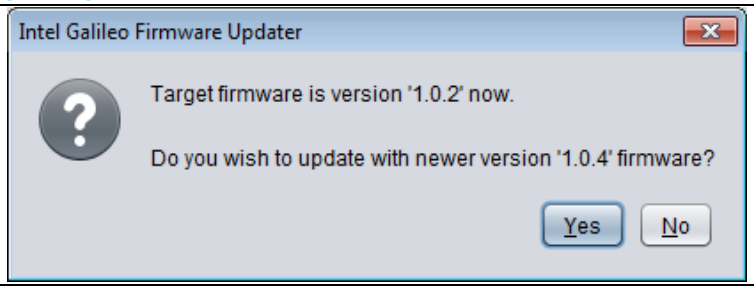
A dialog message displays (Figure 6) asking you to confirm that the power supply is connected to the Intel® Galileo board. If yes, click *OK*.

Figure 6 Dialog requiring the power supply to be connected



A second dialog message displays the current board firmware version and the candidate capsule file version to update the board with (Figure 7). If you agree, click *Yes*.

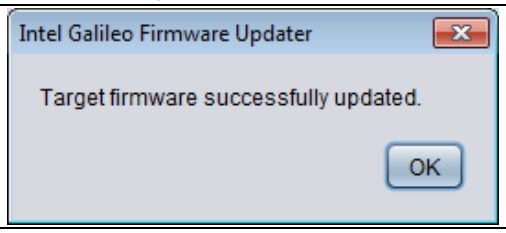
Figure 7 Dialog asking if the update must proceed



Caution: At this point, the firmware update process starts. During this process, do *not* remove the USB cable or power supply. The update will take approximately 5 minutes to complete.

If the firmware successfully updates, the message in Figure 8 displays.

Figure 8 Firmware updated successfully



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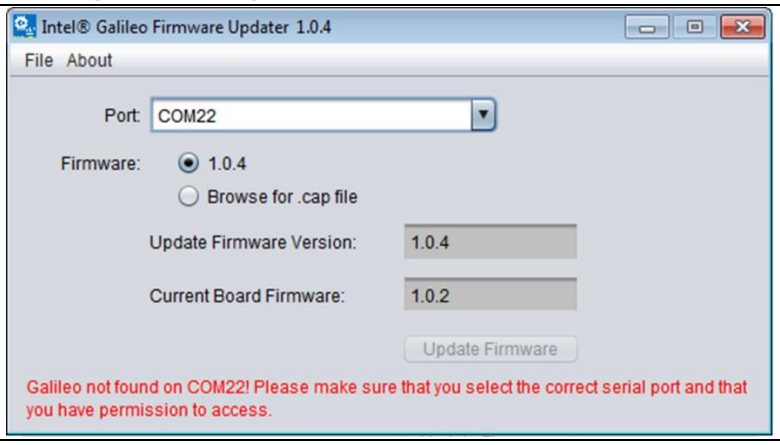
4 Troubleshooting

This chapter explains how to resolve problems that might occur if the drivers are not properly installed or if you select the wrong serial ports in the Intel® Galileo Firmware Updater tool.

4.1 Wrong serial port

If you select a serial port that is not connected to an Intel® Galileo board, an error message displays in the bottom of the application window and the *Update Firmware* button is disabled (Figure 9).

Figure 9 Error message when wrong serial port is selected



Verify the serial port as explained in section 2.4, then update the firmware again, using the correct serial port.

4.2 Antivirus blocking serial ports

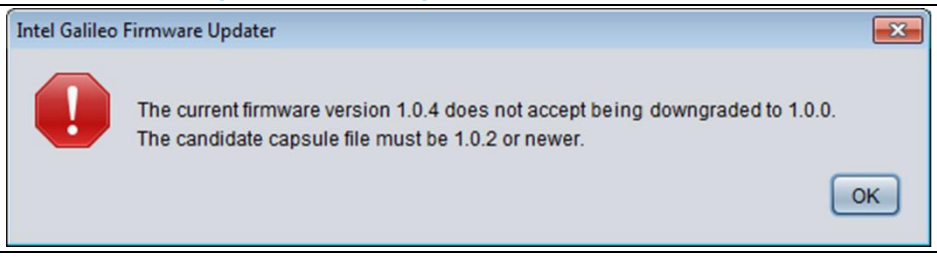
Antivirus software might block the serial ports when thirty-party applications try to access it. A solution for this is to create an exception rule to Intel® Galileo Firmware Updater tool on the antivirus installed. Sometimes even if the select serial port is visible and correctly selected, the antivirus application might interfere.

4.3 Downgrade does not work

The Intel® Galileo Firmware Updater tool has a precautionary setting that prevents you from downgrading (and thus "bricking") an Intel® Galileo board if its current firmware version is v1.0.2 or newer and the firmware capsule file you want to install is older than v1.0.2. If you attempt to downgrade the firmware under these circumstances, an error message displays (Figure 9). For example, if the board's current firmware is v1.0.4, it is possible to downgrade to v1.0.2 or v1.0.3, but not to anything *older than* v1.0.2.

If the board contains a firmware version earlier than v1.0.2, downgrading to an older capsule file is allowed.

Figure 10 Invalid downgrade error message



4.4 Serial ports cannot be selected on Linux*

If after to follow all steps on section 3 and the serial ports are not selectable in the application, it means is necessary to provide the correct user permission to the serial ports. There are two ways to solve this issue:

- By adding the user to the dialup group with the following command:

```
sudo usermod -aG dialout <mylogin>
```

- Or by executing the application using *sudo*. For example:

```
sudo firmware-updater-1.0.4
```

4.5 Recovering a "bricked" Intel® Galileo board

Several reasons might contribute to brick Intel® Galileo boards like the removal of USB cable or power supply during firmware update or failures in the host computer. If the board is bricked it is possible to recover the board following the *Force Recovery* section in the document *Galileo Board User Guide*, which is available at *http://www.intel.com/support/galileo/sb/CS-035225.htm*.

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5 Known Issues

This section lists known issues and some scenarios you should avoid to guarantee the functionality of the tool.

5.1 Instability on virtual machines

During testing, we verified several instabilities when virtual machines are using the serial ports enumerated by host computers. Avoid using virtual machines; instead use the firmware updater tool on real host computers.

5.2 Firmware update fails with SD card images

The firmware updater tool will not work if the Intel® Galileo board is running from an SD card release image. To resolve this problem, do the following:

1. Remove the SD card (if there is one) from the SD card slot.
2. Click *Reboot* to reboot the board.

5.3 Does not work when sketches are running

If an Arduino* sketch is running, the firmware update will fail. To resolve this problem, do the following:

1. Remove the SD card (if there is one) from the SD card slot.
2. Click *Reboot* to reboot the board.

5.4 Does not flash multiple boards

We do not recommend flashing more than one board at a time. Using more than one board with this application might cause failures in the flash process and brick one or more of the boards. When flashing an Intel® Galileo board, disconnect other boards form your host during the flash process, to avoid any possible problems.

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