

How to update the firmware of your Topcon GB1000 GNSS receiver

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Abstract

This document details how to update the firmware of the Topcon GB1000 to the latest 3.5p5 version released after the GPS week rollover of 2019. It is recommended to do that if you want to get the best of your GB1000 after the rollover.

Firmware update can be done with FLoader and TRU (Topcon Receiver Utility) programs and these two options are presented in this document.

*What is the GPS week rollover? Explanantion from Topcon: "The GPS satellites send a 10-digit binary communication message toward Earth with a "week number" counted from 0000 to 1023. Once the maximum coded week of 1024 is reached (which takes 19.7 years), the week number value resets to 0000. The last GPS Week Rollover event occurred on **April 6, 2019, at 23:59:42 UTC.**"*

1 Requirements

To achieve the firmware update of your GB1000 GNSS receiver, you will need the followings:

- A GB1000 receiver with its power cable and a power source. If you are in the field without power source, you can try with two fully charged batteries.
- A Topcon serial cable to connect to your GB1000.
- A computer running on Windows with a serial port otherwise a USB port and USB to serial adaptor.
- FLoader program installed on your computer if you choose this option. This software can be found at <https://positioning.topcon.co.jp/en/application/utility/>. You must create an account to access this page but it is free.

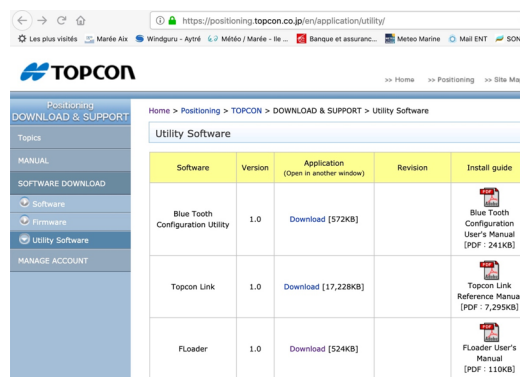


Figure 1: Topcon page to download FLoader software

- TRU program installed on your computer if you choose this way. This software can be found at <https://www.topconpositioning.com/support/products/tru-topcon-receiver-utility>. You must sign in to access this page. It is also free.

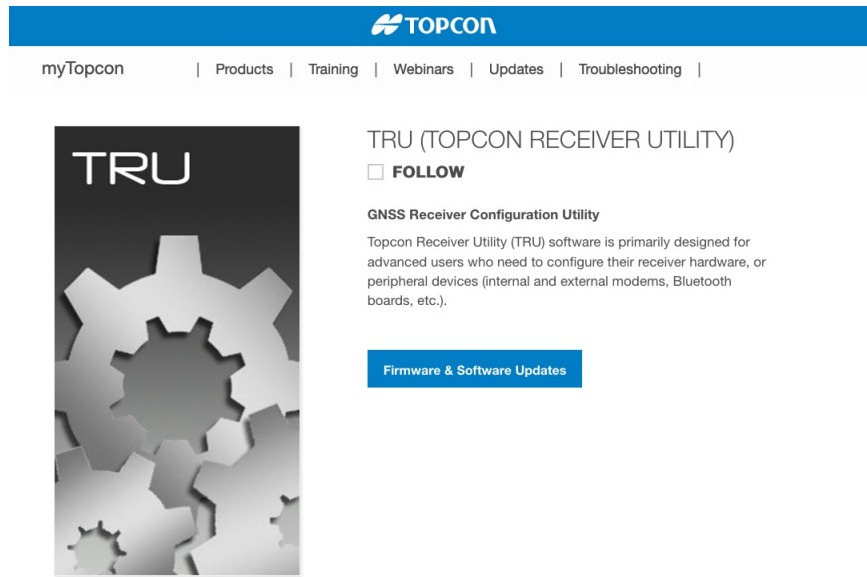


Figure 2: Topcon page to download TRU software

- Obviously, you will need to download the latest version of the firmware that has been released for the GB1000. In our situation, it is the 3.5p5 version that we want to install. You will find two versions of this firmware. You must download the correct one depending on the board you GB1000 is running with (check the hardware specifications of your receiver). In my case I only have EGGDT boards.

Sign in with an email and password to access Topcon resources and download the appropriate firmware files at https://www.topconpositioning.com/support/updates/GB_500.

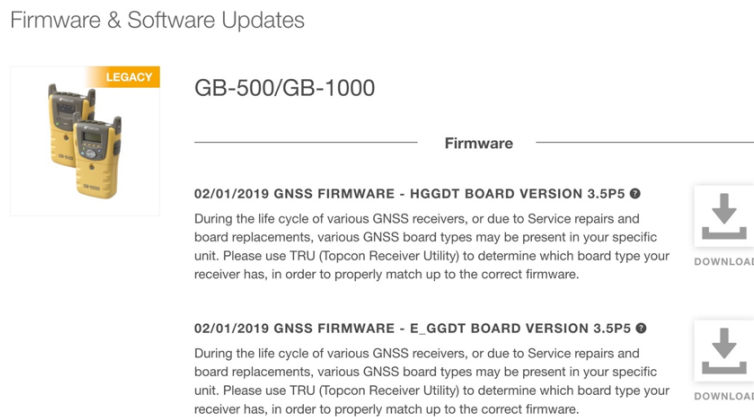


Figure 3: Topcon page to download GB1000 latest firmware release

2 Interfacing the GB1000 with your computer

- Power on your GB1000 receiver and your computer.
- Plug in a serial cable into your GB1000 and connect it to your computer through a USB-serial adaptor as shown below.



Figure 4: Cable connections

3 Updating the firmware of a GB1000 receiver with FLoader

3.1 Connecting to the GB1000 through FLoader

- Start FLoader on your computer.
- Click on *Connection* tab and choose the proper COM port and baud rate. This depends on your computer configuration as well as the GB1000 serial port configuration.
- In FLoader *Device* tab you will access the parameters of your GB1000 if the connection is made. In this tab, you can identify the board version of your receiver.

3.2 Loading the new firmware with FLoader

- In FLoader, got to *Program* tab. Choose *Capture Method: Soft Break Capture*.
- Go to the firmware files you downloaded previously and unzip the board version you need. In our case it is 27-040001-12-eggdt_3.5p5.

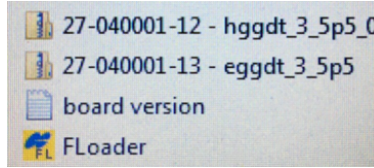
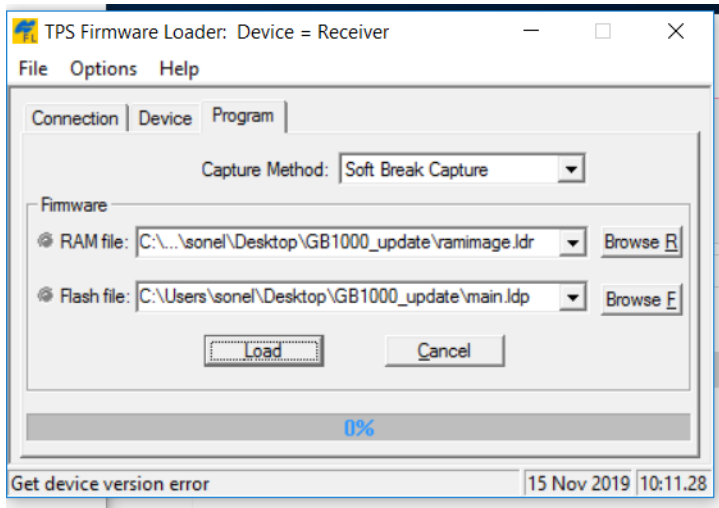
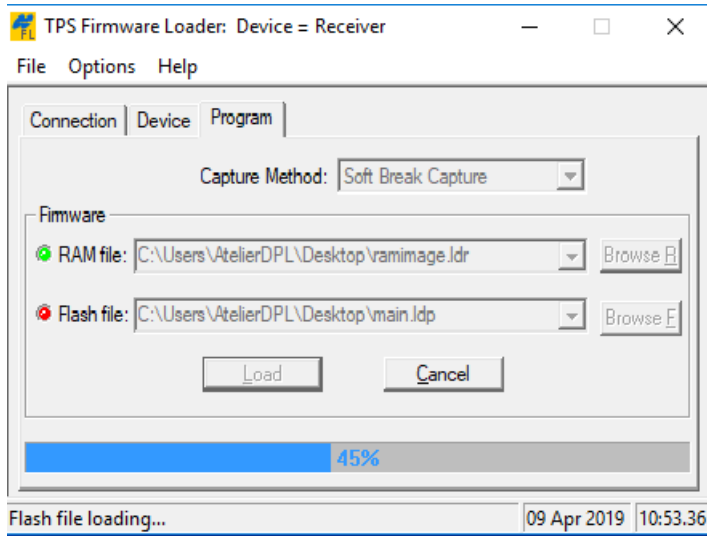


Figure 5: The firmware zipped files downloaded off the internet

- You will get a folder eggdt_3.5p5 containing 3 files: main.ldp, powbrd.ldr and ramimage.ldr.
 - For the RAM file browse to ramimage.ldr file.
 - For the Flash file browse to main.ldp file.



- Push *Load* and the progress bar will start filling first the RAM file and then the Flash file.



- Meanwhile, this is what you will see on the GB1000 screen. Once the progress bar is 100% full, it will come back to a regular display. You can then exit FLoader.

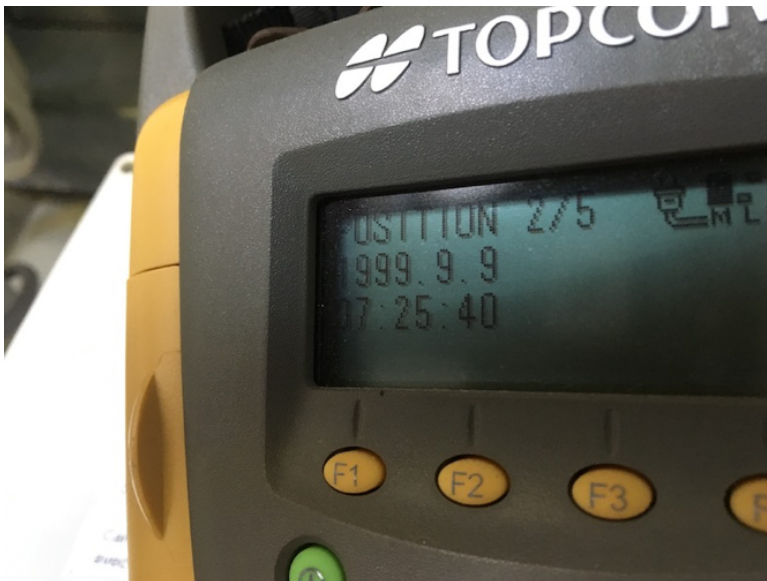


3.3 Checking that the new firmware has been properly installed on your GB1000

- Go to the hardware menu of your GB1000 and check that you now have the 3.5p5 firmware version installed.



- On the time display of your GB1000 you still have a date in 1999, 19.7 years ago. But this is due to the display software of the GB1000 that has no been delivered yet. Visit Unavco page¹ step 3 to have more details.



- The correct time verification to do is to connect to the GB1000 via PCCDU software and check that you have a correct date and time for your current logging data file.

3.3.1 Trouble with loading the firmware through FLoader

I recently encountered an error while trying to update the GB1000 s/n T225782 with FLoader. The loading was interrupted and the following error message *Get device version error* showed up at the bottom left of the window.

¹<https://kb.unavco.org/kb/article/preparing-gps-gnss-receivers-and-hardware-for-the-april-6-2019-gps-week-number-rollover-wnro-867.html>

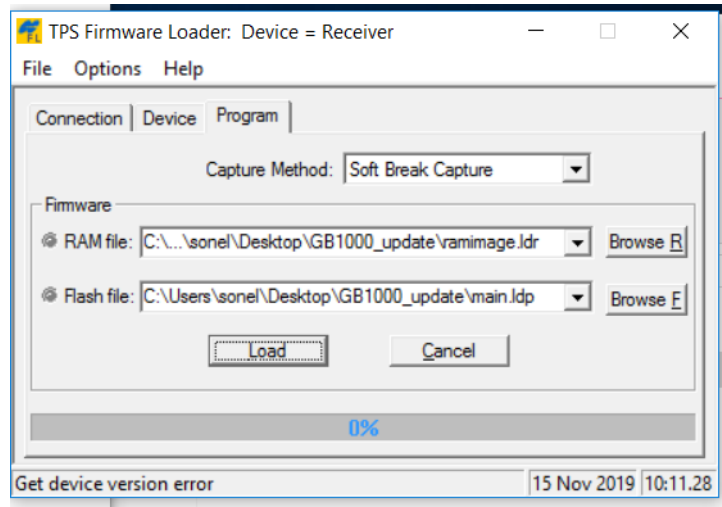


Figure 6: Error message *Get device version error*

That's why I explored another option with TRU software and this is what is presented in the second part of this document.

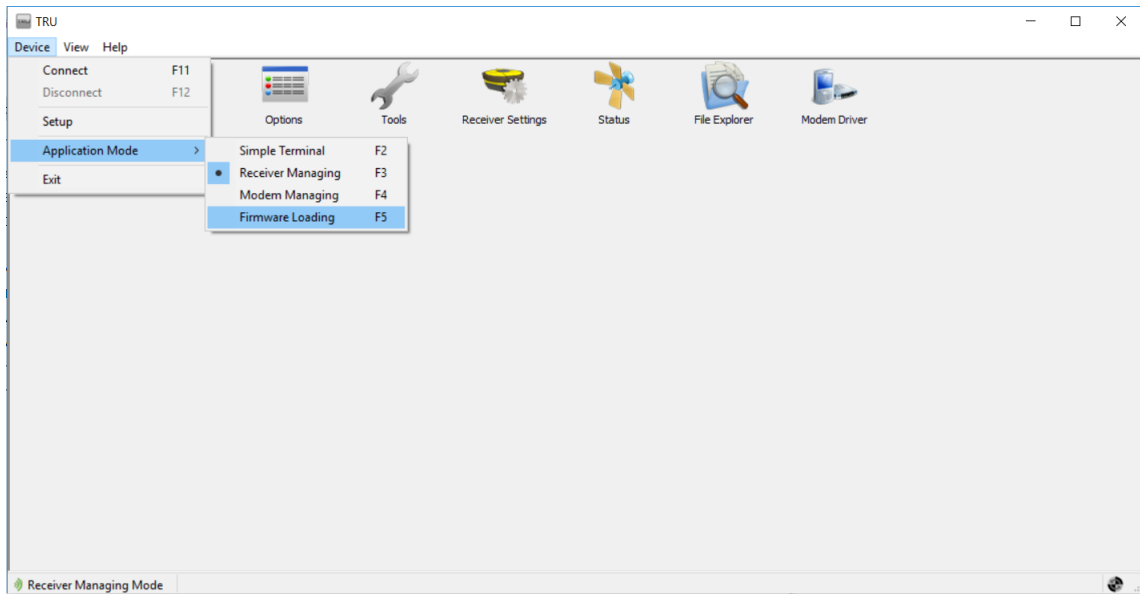
4 Updating the firmware of a GB1000 receiver with TRU

4.1 Connecting to the GB1000 through TRU

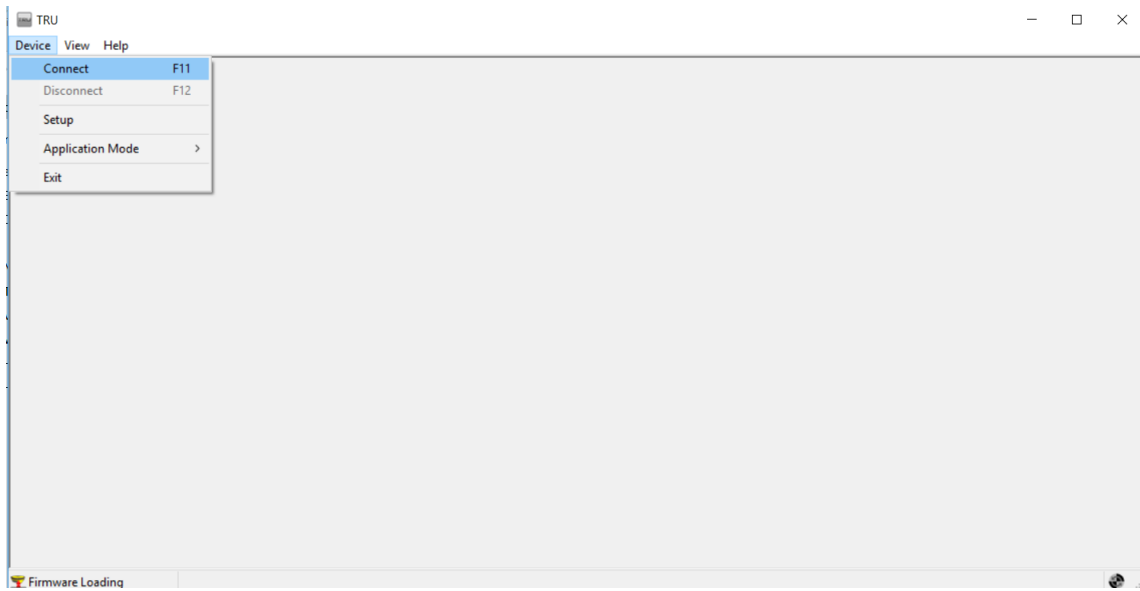
- On your computer, run the software TRU (Topcon Receiver Utility).



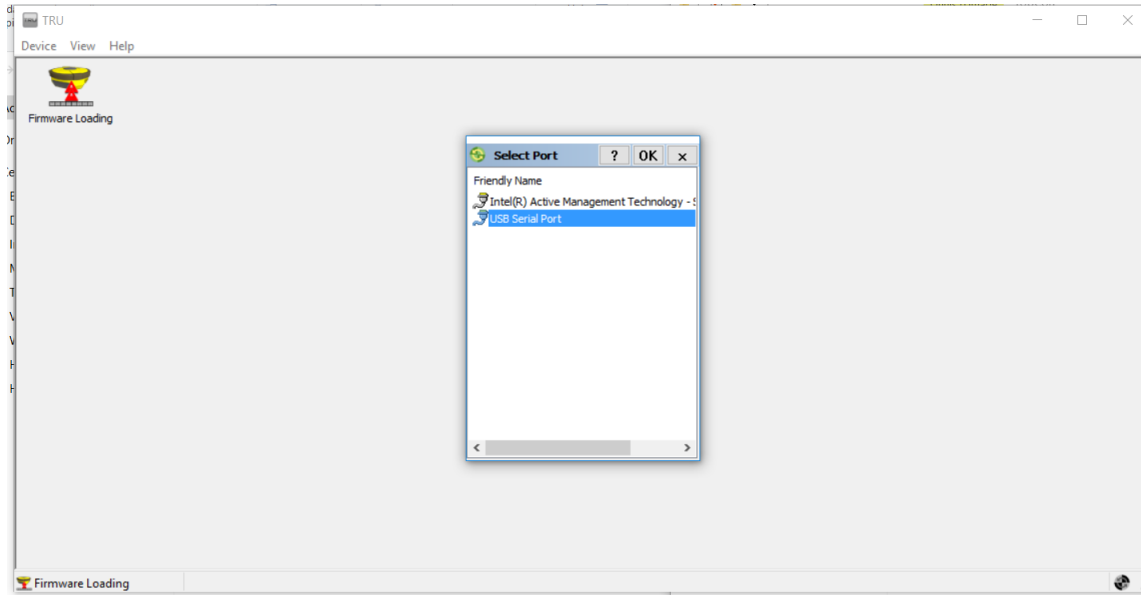
- Go to menu *Device/Application Mode/Firmware loading* as shown below:



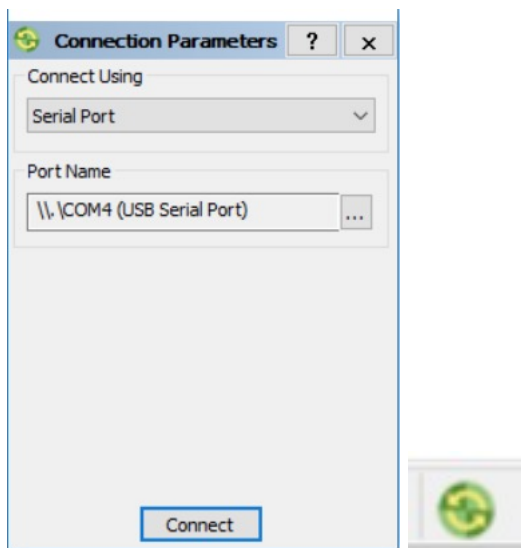
- Go to menu *Device/Connect*.



- Select *USB Serial port*.

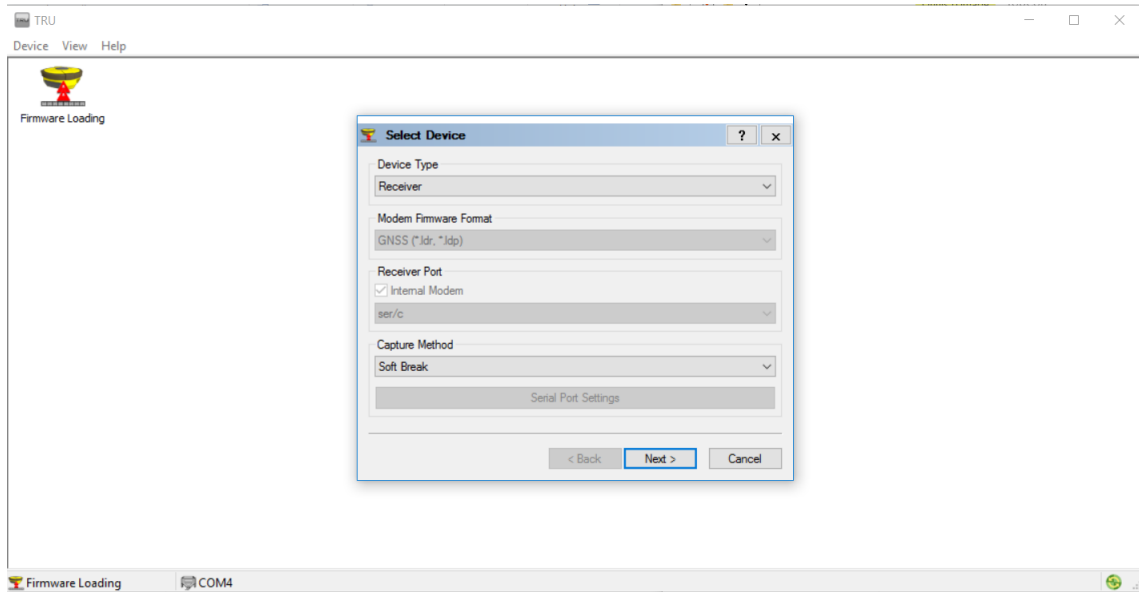


- Choose the right port name and push the *Connect* button. At the lower right corner of your window the radio button will go green once you are connected or remains black if not.

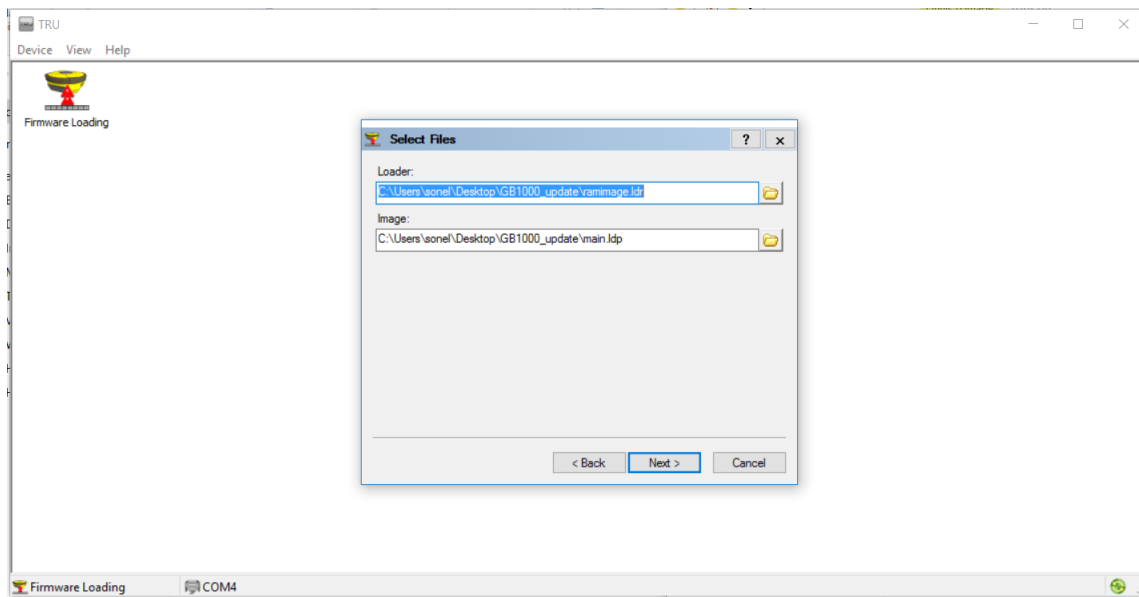


4.2 Loading the new firmware into the GB1000

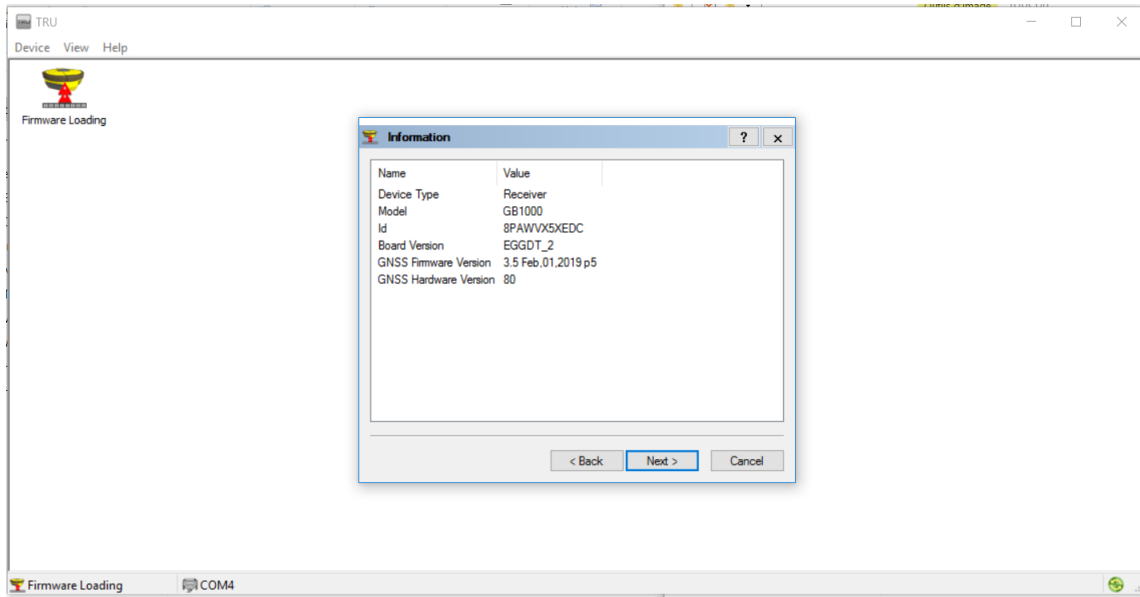
- Click on *Firmware Loading* logo and fill in the right parameters in the *Select Device* window. Push *Next* button
 - Device Type: Receiver
 - Modem Firmware Format: GNSS(*.ldr, *.ldp)
 - Receiver Port: Internal Modem box ticked, ser/c
 - Capture Method: Soft Break



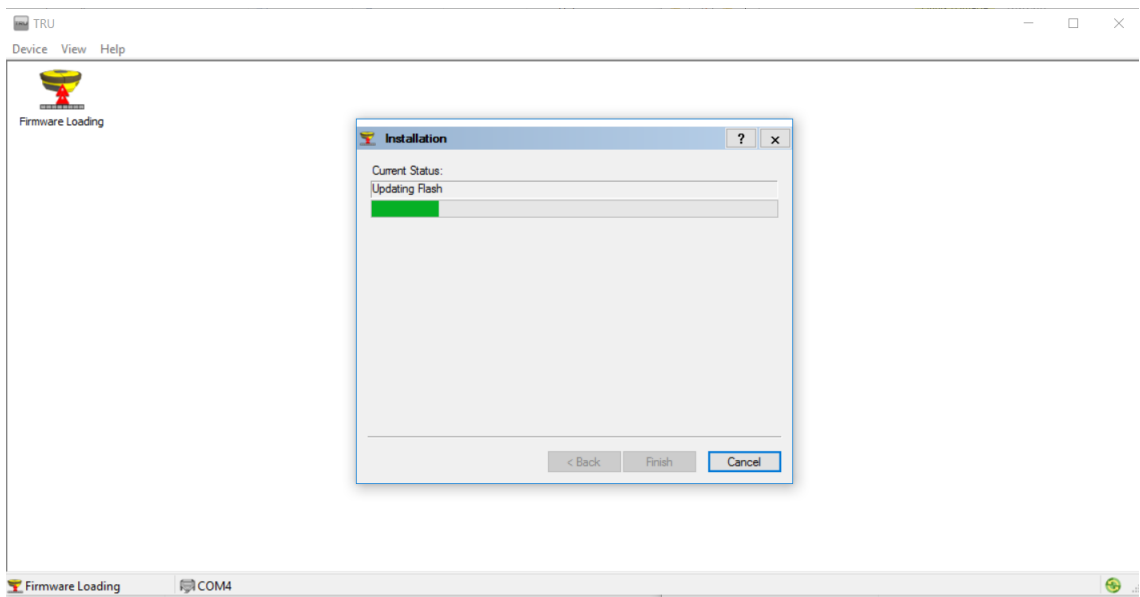
- Select the right files corresponding to the firmware version you want to install and the EGGDT or HGGDT board version of your GB1000. These files are in the archive you downloaded at the very beginning of this procedure. Then push the *Next* button.
 - Loader: ramimage.ldr
 - Image: main.ldr

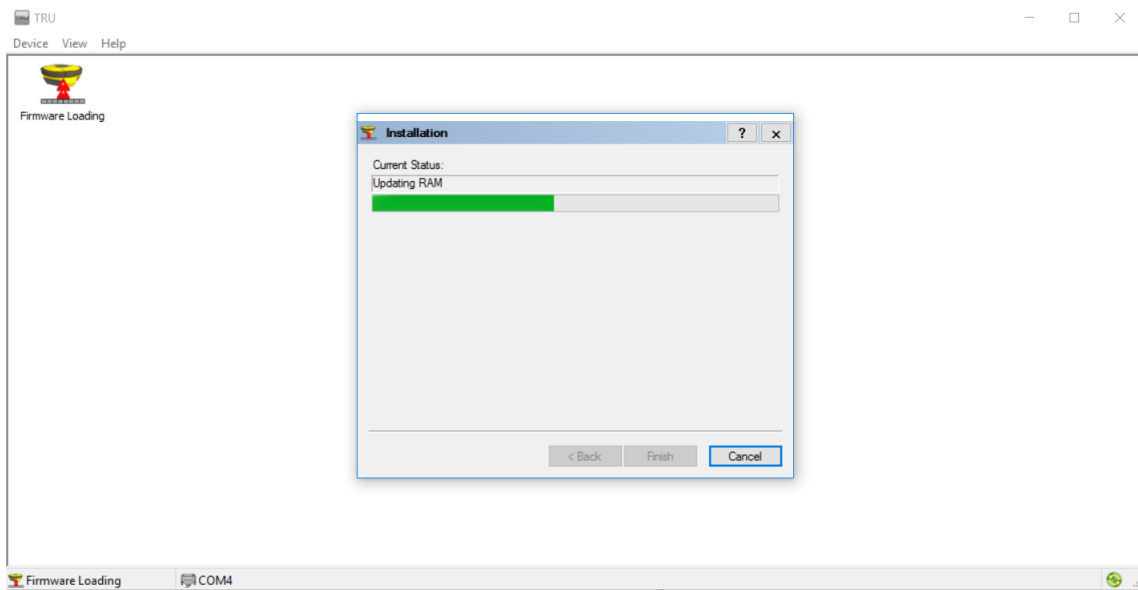


- The coming window gives you informations about the receiver hardware and firmware right before the update. Push *Next* button.

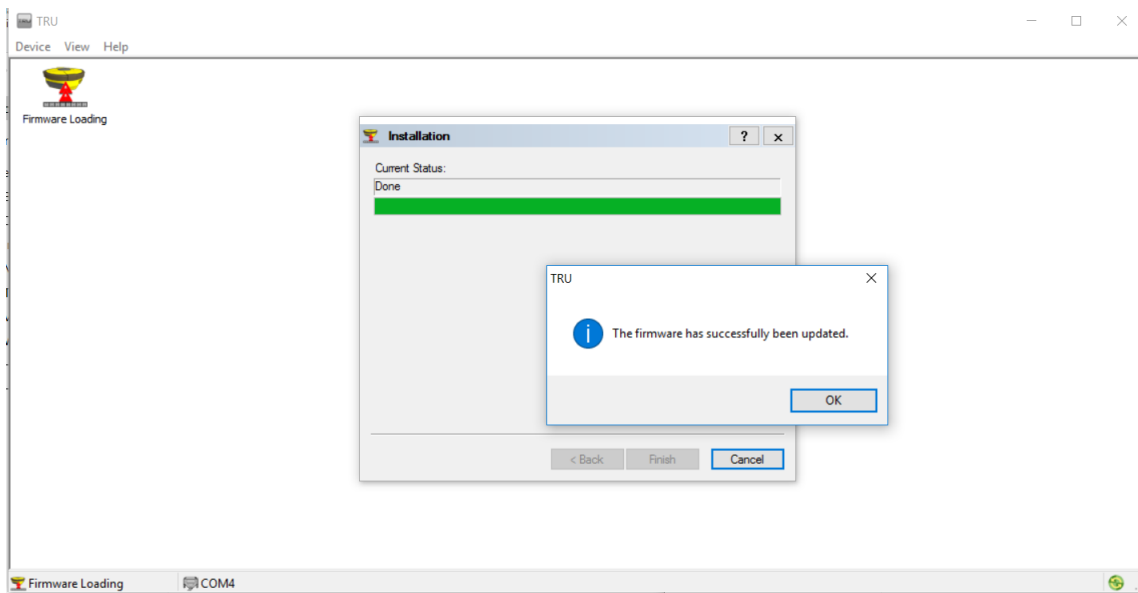


- During the firmware installation, you will see two windows subsequently and a progress bar mentioning *Updating RAM* then *Updating Flash* if everything goes well.



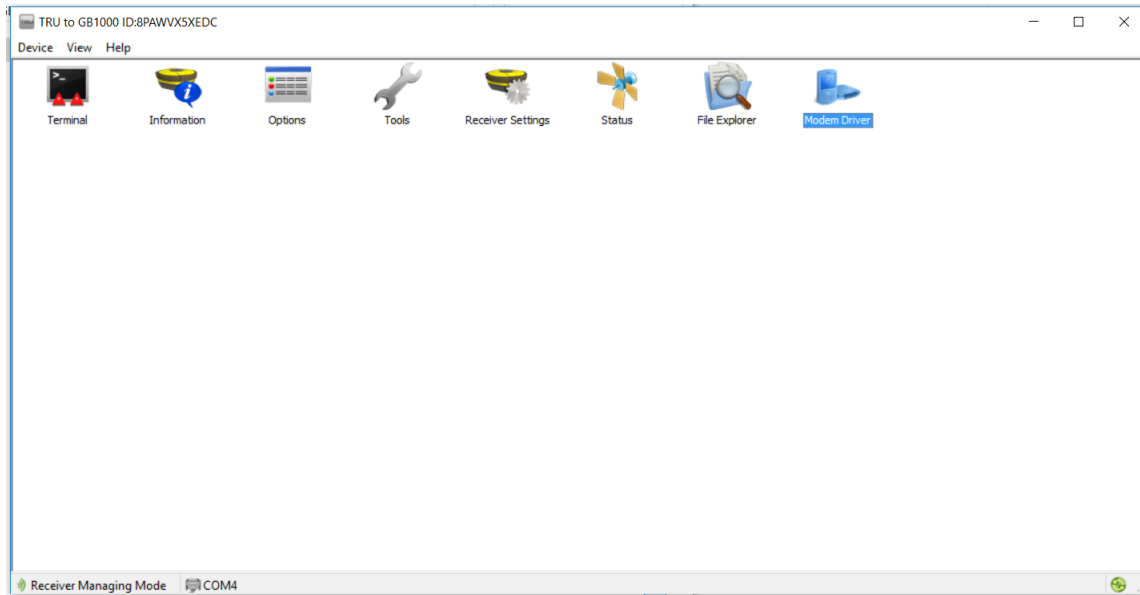


- A few minutes later, you will get this window if your firmware update has been successful. Well done, you made it! Your old GB1000 is now back to business!

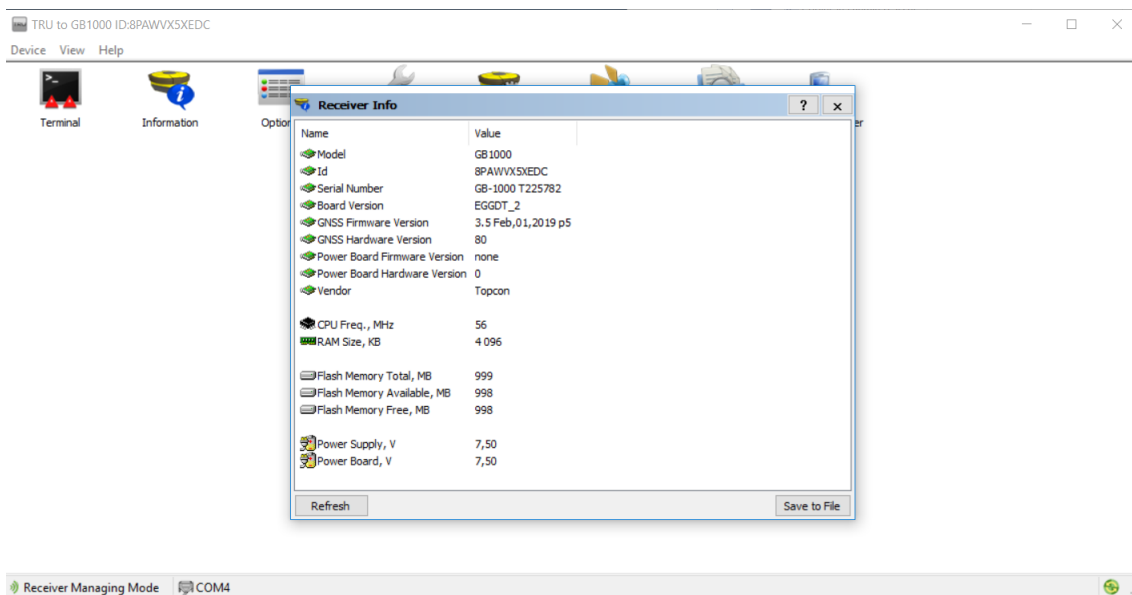


4.3 Checking your firmware version

- After performing the update, exit the Firmware Loading utility and connect to the receiver through TRU via the menu *Device/Application Mode/Receiver Managing*.



- The information window will show to you that the GNSS version is now 3.5 Feb,01,2019 p5 which is what we expect.



- You can also check the new firmware version of your GB1000 like explained in section 3.3.