
Updating the XD-C or XD-M controller



Xeryon drivers for ultrasonic stages

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1. Introduction

Our controllers are constantly being modified to provide the best service. Often, it is not needed to change anything on the Xeryon controllers you are using. Sometimes however, it might be necessary to update the software on one or more of your Xeryon controllers.

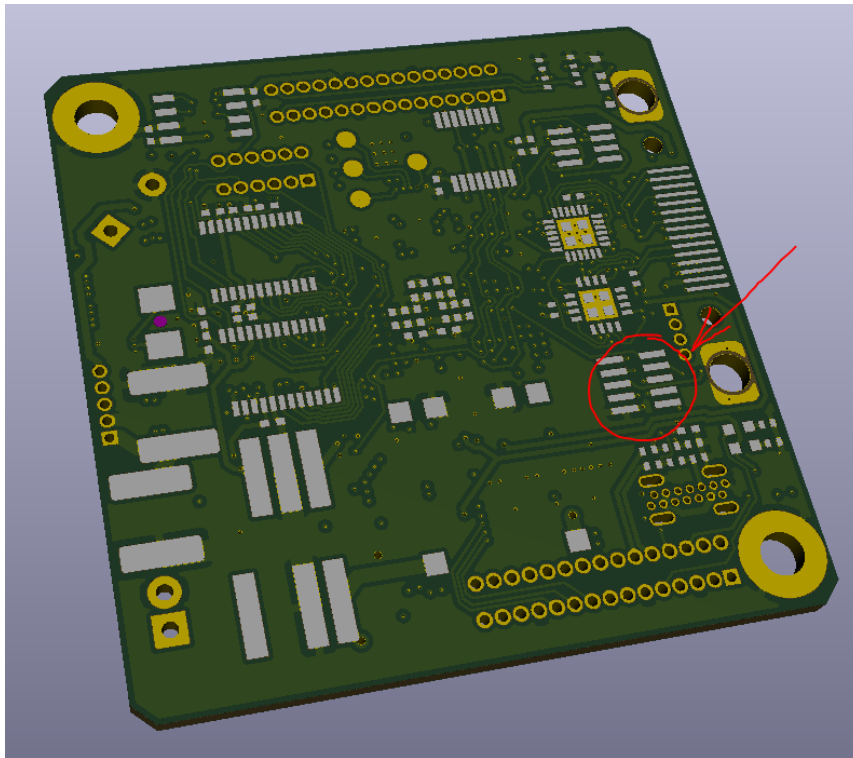
This guide describes the steps to take to put the software up to date with the latest version.

2. Updating the controllers

The XD-M controller is built up by combining several XD-C controllers connected by an internal bus. Therefore, updating the XD-M is similar to updating the XD-C. For the XD-M each individual XD-C board has to be updated. The first controller (having the USB-C connector) is the master, the others are slaves. The master has a different FPGA program as compared to the slaves.

The connector for updating the firmware is on top of the lower PCB, but hidden by the upper PCB. You first have to remove the upper PCB.

The connector is next to the USB, behind the Dsub connector.

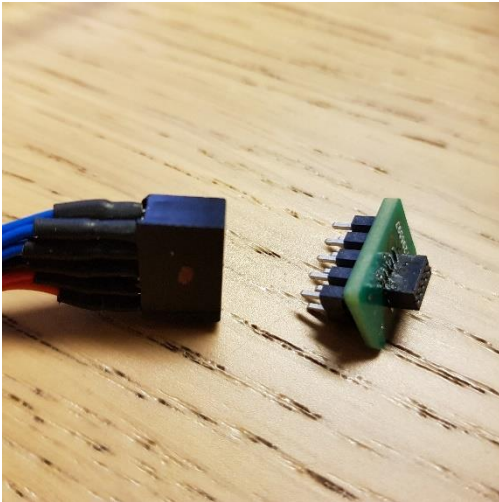


The connector:

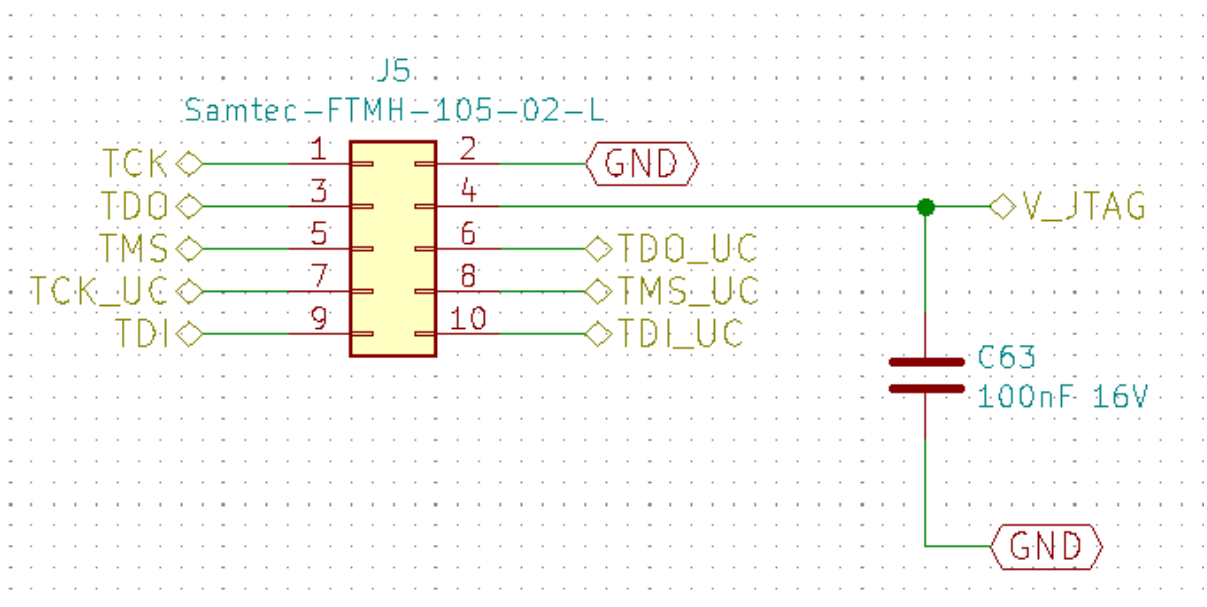
- Type: Samtec-FTMH-105-02-L
- Pitch: 1 mm

The correct mating connectors are: MLE or CLM series. We use the MLE.

We made a small interconnect PCB with the MLE on one side and an standard pitch header on the other side.



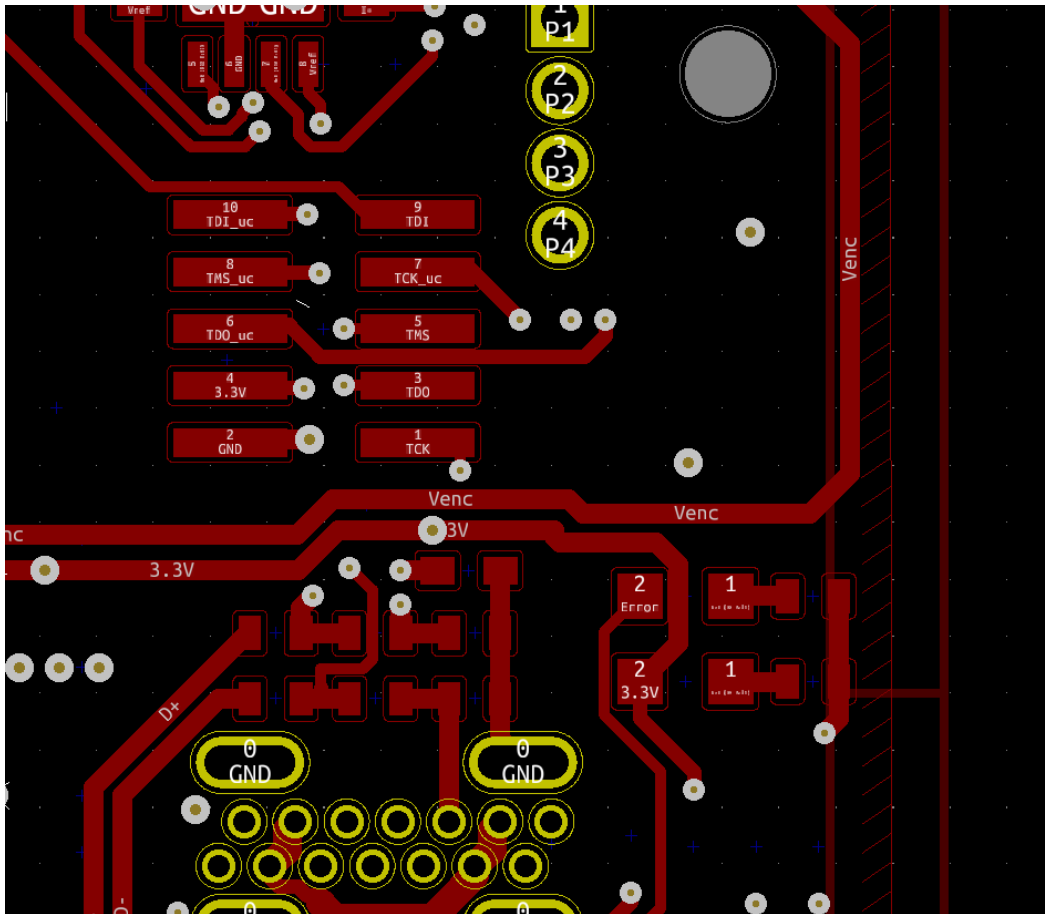
The pinout of this connector:



JTAG signals for the microcontroller: TDO_UC, TMS_UC, TDI_UC, TCK_UC

JTAG signals for the FPGA: TDO, TMS, TDI, TCK

The pinout on the PCB:



2.1. Programming the microcontroller and the FPGA

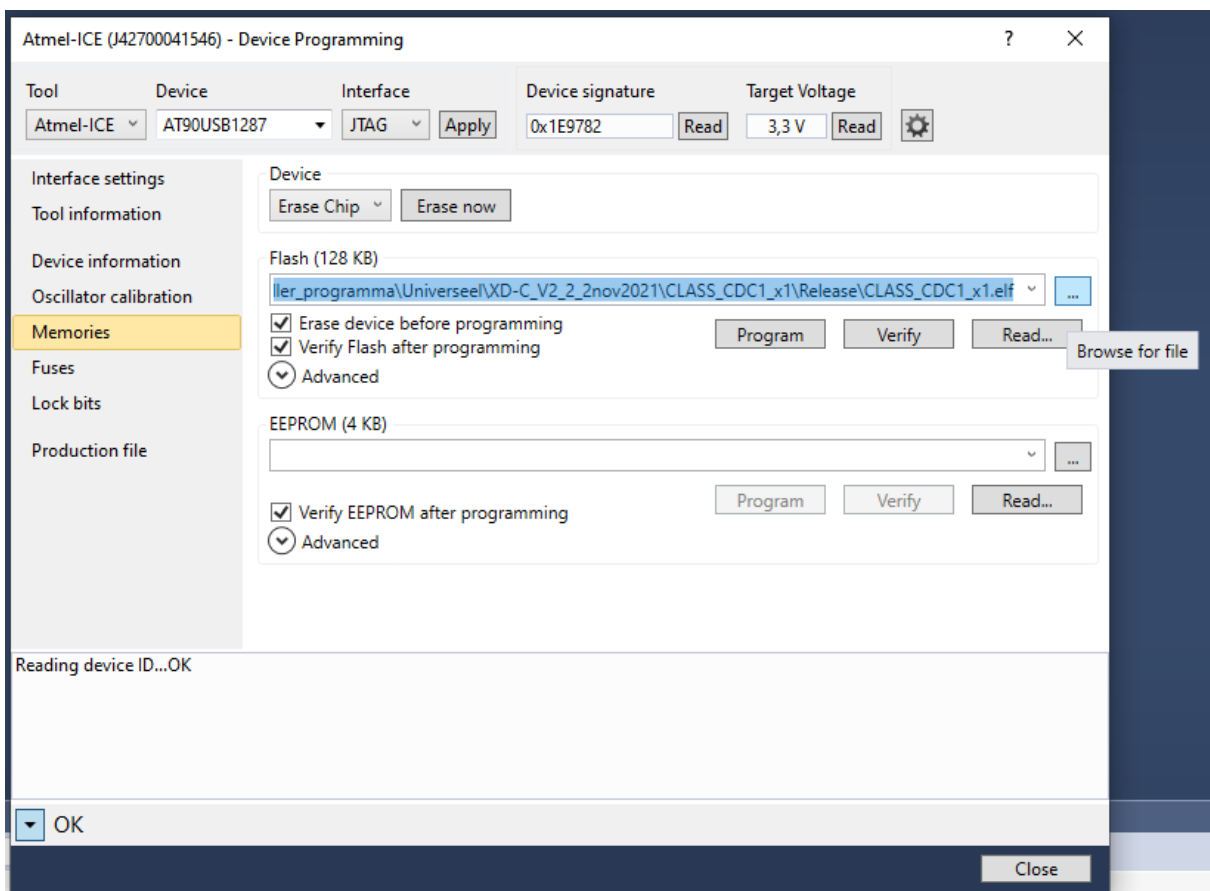
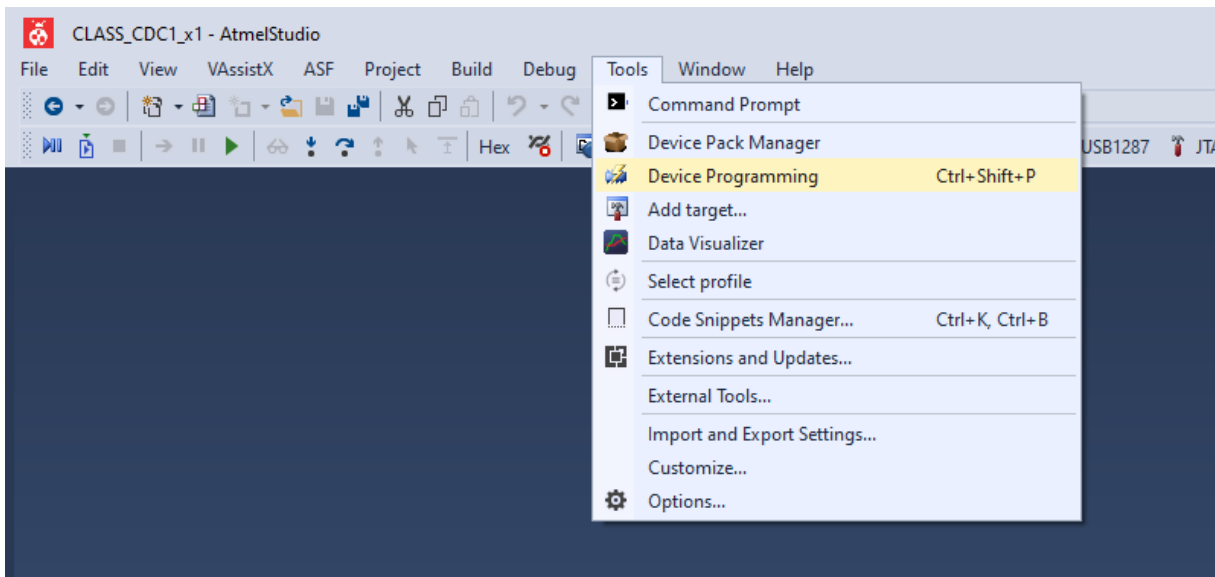
There is a single programming connector for both the FPGA and microcontroller. Both programming tools can be on and active at the same time.

The controller has to be powered during programming.


You can plug in and remove the programming connector without shutting down the power. To our experience it causes no damage.

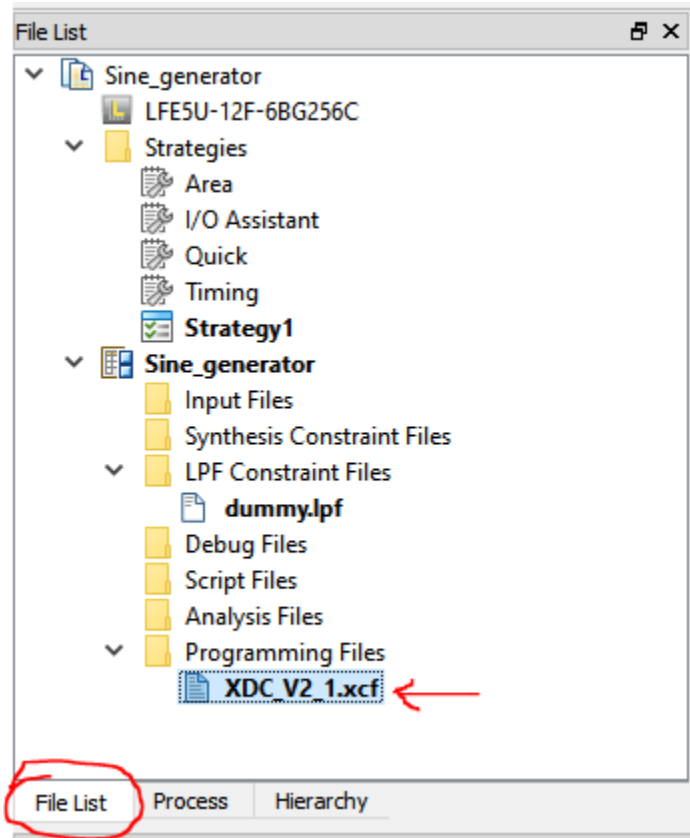
2.2. Programming the microcontroller

- Open Atmel Studio
- Maybe you need to make a dummy empty project
- Select in the menu: Tools -> Device Programming
- Select tool: Atmel-ICE, click 'Apply', click 'Read Device signature'
- In 'Memories' select the programming file we provided. Flash, browse for file. See picture.
- Click 'Program'

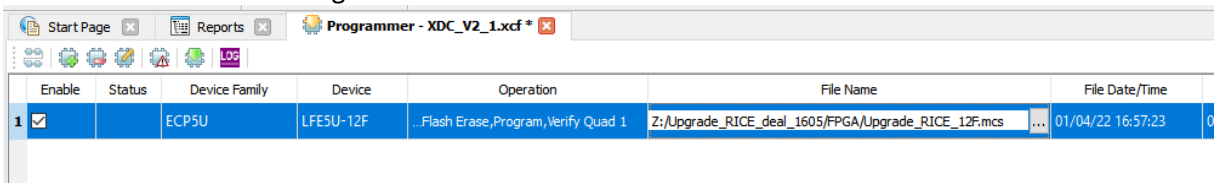


2.3. Programming the FPGA

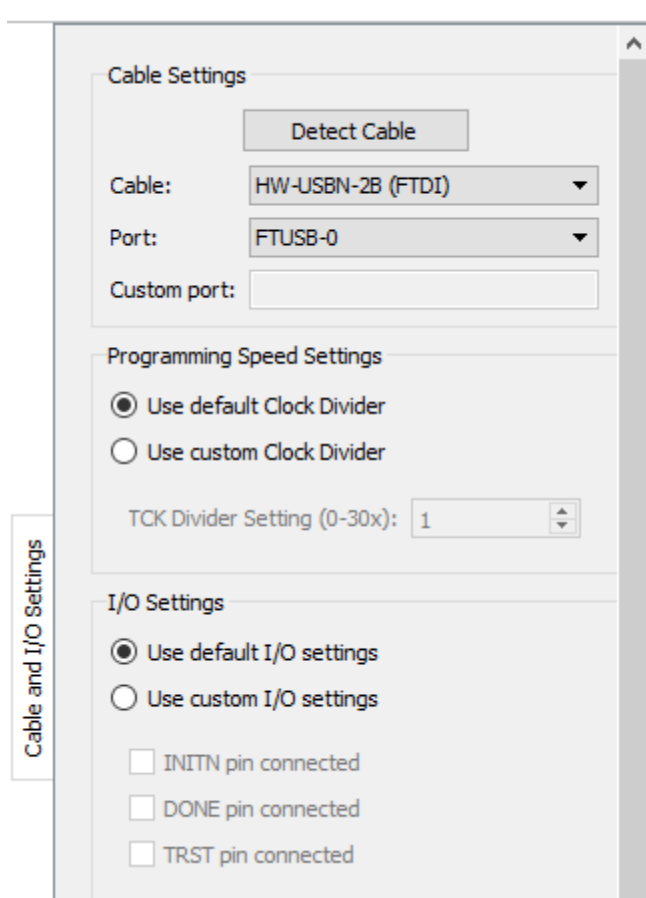
- Open Lattice Diamond programmer
- Open project file XDC_V2_1.lfd
- Open the programming file XDC_V2_1.xcf or click on the programmer icon 



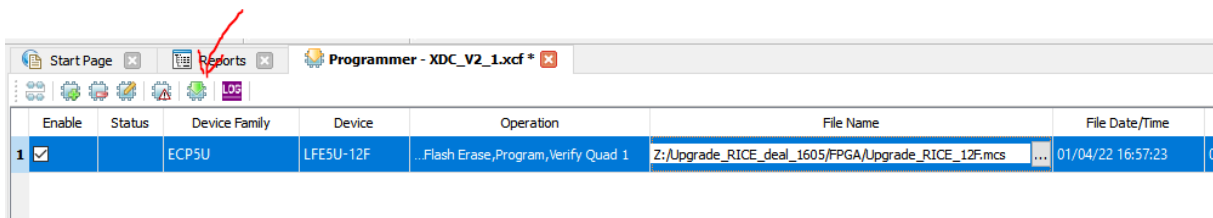
- You should see the following user interface:



- Select the correct path and filename (.mcs file provided by us).
- On the right side of the window there is 'Cable Settings'. It may be necessary to click 'Detect Cable' or select the correct cable, although this is often working automatically.



- To start the programming of the FPGA, click on the program icon



- Programming may take a while. It goes through several steps such as Check, Erase, Program and Verify. Wait until you get the message that programming is ready.

2.4. Configuring the controller

After updating the firmware the configuration and settings of the controller will be corrupt. I will provide a script to run in the Windows GUI to set the correct configuration and upload the settings again.

3. Customer service

- Contact: support@xeryon.com
- Address: Interleuvenlaan 21, B-3001 Leuven, Belgium
- Phone: +32 (0)16 903 904
- Website: www.xeryon.com