

# **How to program the Parallax-Stratix board**

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## 0.1 Before you program the device.

Before the program can be downloaded to the hardware you need a fully compiled project from the Quartus software. Be sure that your device is powered and the programming cable (refer to section 0.2.1) is connected to the device and the computer.

## 0.2 Programming the FPGA

When programming the FPGA, the data will be lost when the device is not powered. When the program should remain in the system it must be written to the memory. (refer to chapter ??).

### 0.2.1 What are the possibilities?

There are two ways to program the FPGA.

- Using the ByteblasterII in Quartus.
- Using a serial cable and the memory loader "PX.exe".

During the download process a red led next to the  $\mu$  - controller will be on. When the led is off, the downloading is finished and the program starts. (try it with the project in Folder *ParallaxTEST*)

### 0.2.2 Programming by using the ByteblasterII

As usual:

1. Compile,
2. start programmer,
3. choose device,
4. check *program*,
5. press *START* and
6. enjoy.

### 0.2.3 Programming by using px.exe and a serial cable

If you want to use the memory-loader-program *px.exe* make sure that you enable the checkbox '*Raw Binary File (.rbf)*'. You can find this checkbox in *Settings / Device / Device & Pin Options / Programming Files* .

The *\*.rbf* - file will be generated during the next compilation.

To download this file just drag it on the *pm.exe* with your mouse, or type

```
px yourfile.rbf
```

in the commandline.

A popup-window indicates the progress of the download. During the download the *red* led on the board next to the PX-Loader-controller<sup>1</sup> will be on.

Using this method the program will be deleted, when the board is not powered. To load the program at power-on, it must be written to the memory<sup>2</sup> of the bootloader.

This can be done using an additional comment for the download. By adding */P* in the commandline after the filename the data will be written to the flash-memory.

#### Summary of all commands:

Table 0.1: Using PX.exe to program the board

mode	syntax	LED	Comment
load <i>fpga</i>	px quartusfile.rbf	red	Data lost at power-off
load <i>boot flash</i>	px quartusfile.rbf \P	red, green	stored in boot flash

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<sup>1</sup>SX20AC/SS

<sup>2</sup>M25P80