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Mobiles Hardware-Praktikum
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Lab 3
Fundamentals of Analog and Digital Circuits

For the following two tasks you will need the FPGA extension board (see *Die Erweiterungsmodule zum PICee-Entwicklungssystem*). Connect this board to the PICee system and connect the programming cables as you have done in previous labs.

In this lab the PIC16F84 microprocessor is not used. It is therefore a good idea to program the PIC with a small program that defines both PORTA and PORTB as inputs. This will then isolate the PIC from your design. If this is not done you might have problems with this lab. Also, pin 83 on the FPGA is already connected to the clock on the main PICee board. This means that you do not need to connect any additional clock wires for this design.

Exercise 1

In the second series of labs (lab 3, exercise 2) you developed a "running light" on the EPM7128SLC84-15 FPGA. Now your job is to connect it to the 8 LEDs on the main PICee board. This can be done by connecting the FPGA to PORTB with connecting wires. Once this is done test your design.

In order to make the running light viewable, you must add a suitable clock divider to your circuit (for example, the module *freqdiv*).

If your running light program was incorrect you can use the sample solution that will be posted on the web after the running light lab is complete (available from 27.06.2003).

Exercise 2

The next lab of the previous series (lab 4, exercise 1) you developed an electronic die. Now, like in the first part of this lab, connect the EPM7128SLC84-15 FPGA through PORTB to the LEDs with connecting wires. Use pushbutton S5 or S6 on the main PICee board as control button to roll the die. Again, test your design when you are done.

If your electronic cube was incorrect, you can modify the running lights from task 1 to make the die.

When you are finished with the lab you are required to hand in sketches, pin assignments, and other results obtained from the lab. Compress all appropriate files into one ZIP file and then submit it through the courses Web Site Portal.