Working with the Digilent Tools

The Digilent Adept tools are used to program the FPGA. First thing to do is connect the FPGA board to the PC with the USB cable. The USB connection provides access to JTAG via an FTDI Chip.

After you have connected the board you can check the connection by issuing:

```
#djtgcfg enum
```

The result should look something like:

```
Found 1 device(s)

Device: Nexys3
 Product Name: Nexys3
 User Name: Nexys3
 Serial Number: 210182392989
```

JTAG is organized in chains in order to make it possible to communicate to more than one device with a single JTAG link. Because Adept is not designed for the Nexys series alone but more as a versatile FPGA programming toolchain, the Adept tools need the JTAG ID of the device you want to program. But first we need to initialize the JTAG chain with:

```
# djtgcfg init -d Nexys3
```

The output should again look something like this:

```
Initializing scan chain...
Found Device ID: 34002093

Found 1 device(s):
   Device 0: XC6SLX16
```

Now that the JTAG chain is initialized we can program the FPGA with the bitstream we generated with Xilinx ISE. As we know the device identifier (e.g. *Nexys3*) and the JTAG identifier (e.g. 0) from the previous steps we can easily execute the programmer. Of course you need to specify the filename of your bitstream for the –f <filename> switch. Make sure you change your working directory to where the file is located (i.e. to where the ISE project resides).

```
# djtgcfg prog -d Nexys3 -i 0 -f graphic_out.bit
```

The result should be something like this:

```
Programming device. Do not touch your board. This may take a few minutes...
Programming succeeded.
```

Also the monitor should display "HELLO!" messages :)