

Application Note: AN10098

# How to connect ports via loopback using the Xmos simulator

This application note is a short how-to on programming/using the xTIMEcomposer tools. It shows how to connect ports via loopback using the Xmos simulator.

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## Required tools and libraries

This application note is based on the following components:

- xTIMEcomposer Tools - Version 14.0.0

## Required hardware

Programming how-tos are generally not specific to any particular hardware and can usually run on all Xmos devices. See the contents of the note for full details.

## 1 How to connect ports via loopback using the XMOS simulator

The xTIMEcomposer simulator contains a plugin mechanism that lets you model external components via plugins. As part of the xTIMEcomposer tools, a pre-built loopback plugin is provided which enables ports/pins to be connected, thus allowing testbenches to be written in xC.

For example, compile the following code for the XK-1A target:

```
#include <xs1.h>
#include <print.h>
#include <platform.h>

port p1 = XS1_PORT_1A;
port p2 = XS1_PORT_1B;

int main() {

    par {
        {
            p1 <: 1;
        }
        {
            p2 when pinseq(1) :=> void;
            printstrln("Done!\n");
        }
    }
    return 0;
}
```

The intention is to connect the pins of port *p1* to the pins of port *p2*, thus allowing the example to complete successfully. Note: If you run the above code without making the connection, the execution will pause indefinitely, due to the fact that *p2* will never go high.

There are a number of ways to specify the ports/pins to connect using the loopback plugin.

## 2 Using the port name as defined in the XN file

From within xTIMEcomposer Studio, select the *Simulator* tab of the Run configuration and the *Loopback* tab in the *Plugins* group. Add a new connection from PORT\_SPI\_MISO to PORT\_SPI\_SS.

To run from the command line:

```
xsim --plugin LoopbackPort.dll "-port PORT_SPI_MISO 1 0 -port PORT_SPI_SS 1 0" a.xe
```

### 3 Using the port names as defined by the XS1 architecture

From within xTIMEcomposer Studio, select the *Simulator* tab of the Run configuration and the *Loopback* tab in the *Plugins* group. Add a new connection from tile[0], XS1\_PORT\_1A (offset 0, width 1) to tile[0], XS1\_PORT\_1B (offset 0, width 1).

To run from the command line:

```
xsim --plugin LoopbackPort.dll "-port tile[0] XS1_PORT_1A 1 0 -port tile[0] XS1_PORT_1B 1 0" a.xe
```

## 4 Specifying the pins directly

To run from the command line:

```
xsim --plugin LoopbackPort.dll "-pin 0 X0D00 -pin 0 X0D01" a.xe
```