

# Counter Library

## Description

This library contains 4 counter templates. Each counter supports:

- Resetting
- Counting up
- Counting down
- Loading a value from the input *iLoadValue*

The template parameter TYPE is used to define the type of the counter. For example, if *TYPE = ubyte* then an 8 bits unsigned counter is instantiated. Here is a description of the counter templates.

Counter template	Description
<i>CCounterEvent_T</i>	The operation is triggered by events on inputs: <i>iReset</i> , <i>iUp</i> , <i>iDown</i> , <i>iLoad</i> .
<i>CCounterLevel_T</i>	The counter changes continuously, i.e., at each step or FPGA clock cycle. The operation is determined by the levels on the inputs: <i>iReset</i> , <i>iUp</i> , <i>iDown</i> , <i>iLoad</i> .
<i>CCounterOprEvent_T</i>	The operation is triggered by an event on input <i>iOpr</i> . The value of <i>iOpr</i> determines the operation.
<i>CCounterOprLevel_T</i>	The counter changes continuously, i.e., at each step or FPGA clock cycle. The value of <i>iOpr</i> determines the operation.

The code is straightforward, so you can easily create your own counter by changing the operations. In fact you can create any functions like a shift register or even an ALU (Arithmetic and Logic Unit) or a calculator.

The output always generates an event. If you don't want the event, remove the colon ':' in the assignment. Ex: change *oValue := 0;* to *oValue = 0;*

The library is available at <https://github.com/FreeCores-psC>.

## Test bench usage

1. First double-click **CopyLib.bat**
2. Open the library:  
[C:\Novakod\\_Studio\FreeCoresLib\Arithmetic\\_psC\\_DIY\\_counter\CounterLib.psC](#)
3. Have a look at the code of the four counter templates.
4. Select the test bench for the desired core. You can use it as an example.

Counter template	Test bench directory
<i>CCounterEvent_T</i>	<i>TestCounterEvent</i>
<i>CCounterLevel_T</i>	<i>TestCounterLevel</i>
<i>CCounterOprLevel_T</i>	<i>TestCounterOprLevel</i>
<i>CCounterOprEvent_T</i>	<i>TestCounterOprEventBoard</i> <i>TestCounterOprEventAPI</i>

5. Follow **ReadMe.pdf** in the selected folder.

*Have fun!*