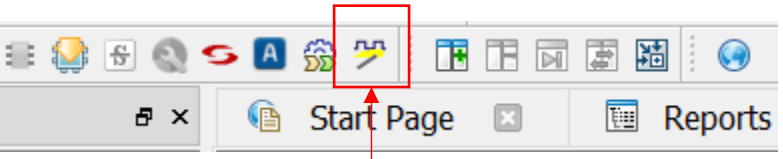
Lattice Diamond Software Simulation and Reveal Tools

Topic

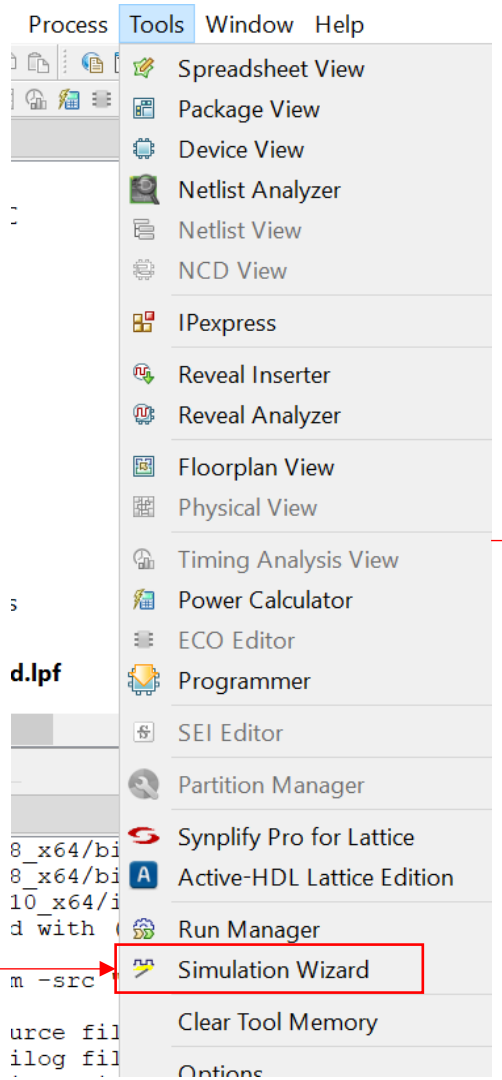
- Use Simulation Wizard tool to simulate the design
- Use Reveal tool to debug the design

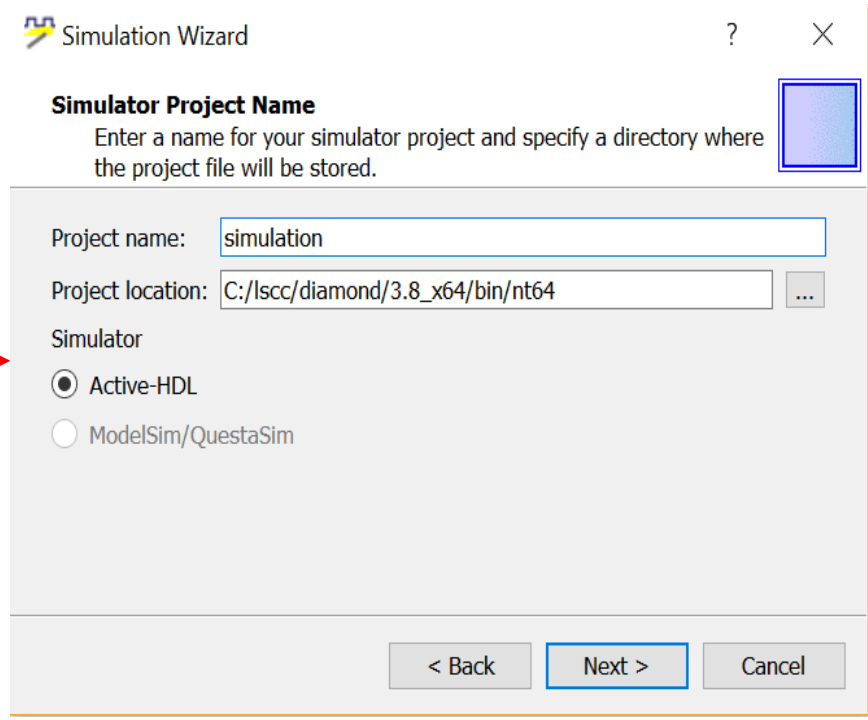
Simulation

Simulation Wizard



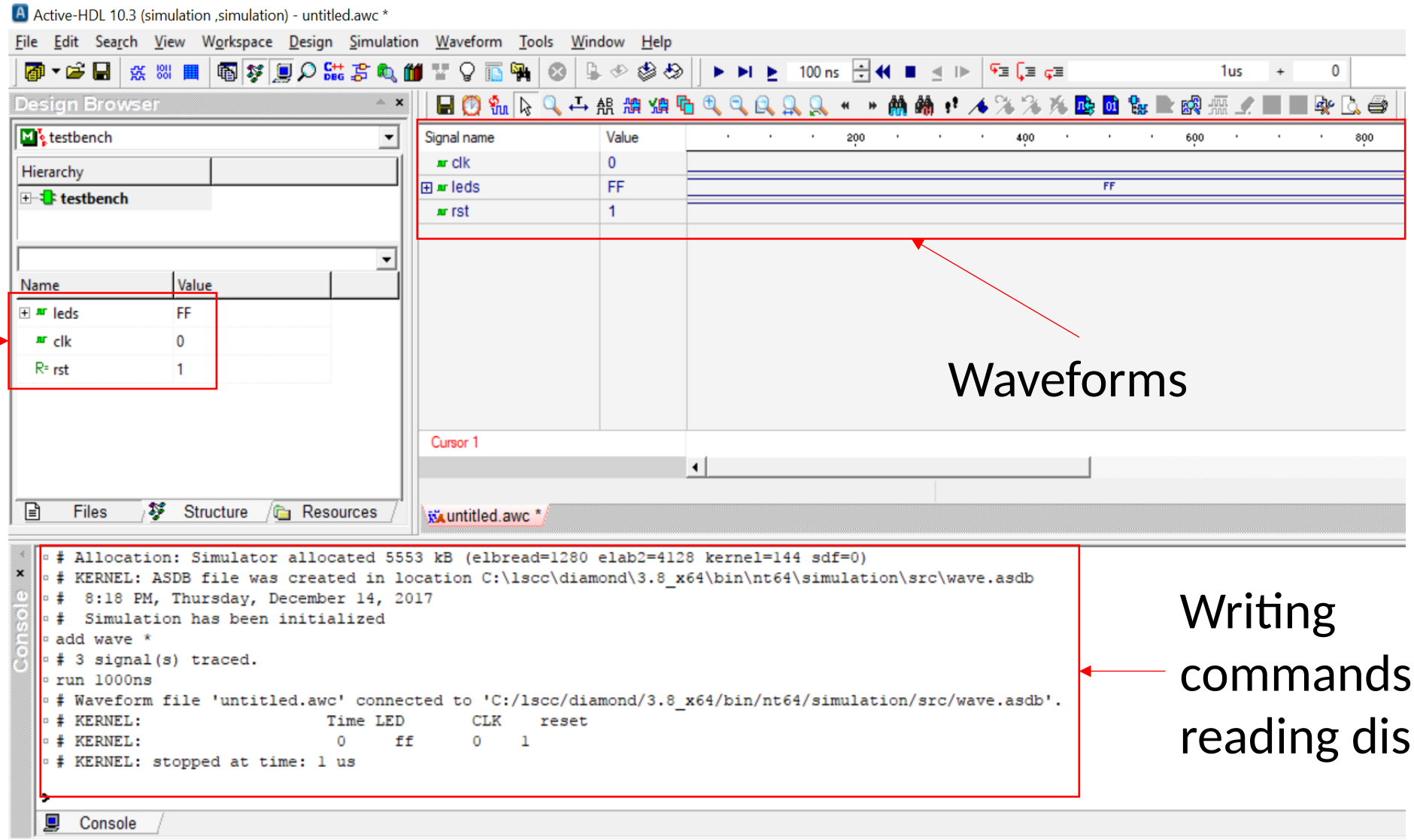
Either way





Simulation Wizard

Variables in the testbench



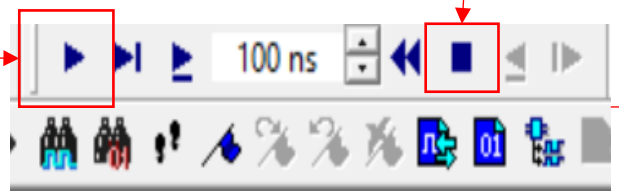
Waveforms

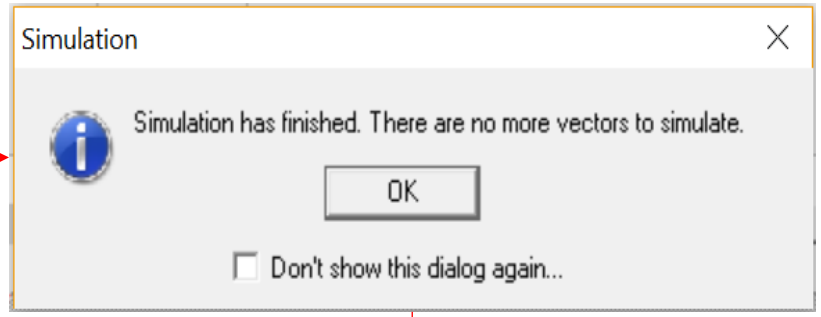
Writing commands or reading displays

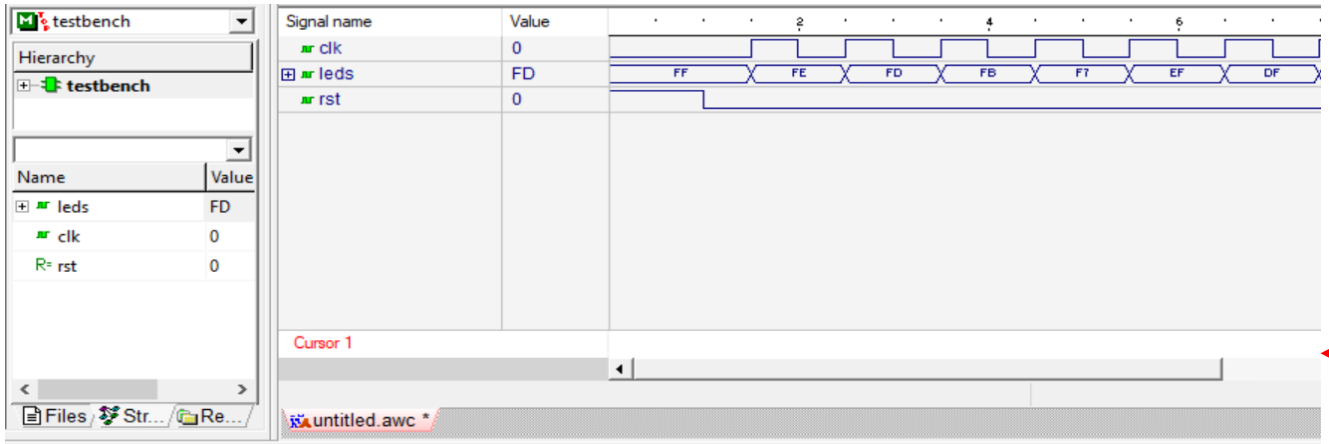
Simulation Wizard

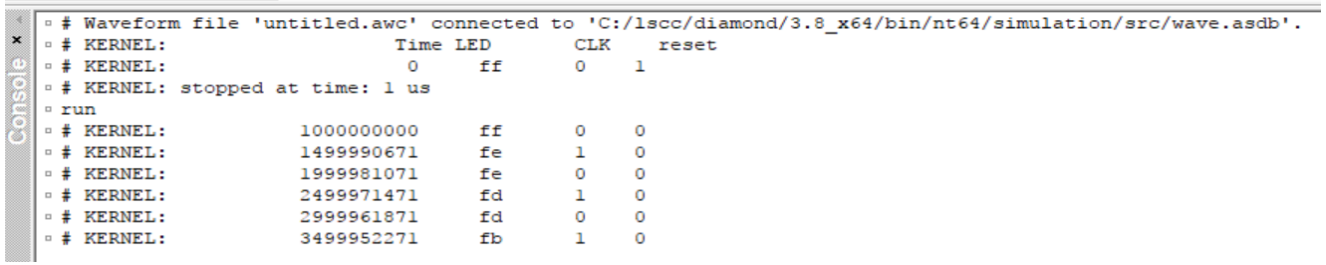
Hit the "run" button

"stop" button





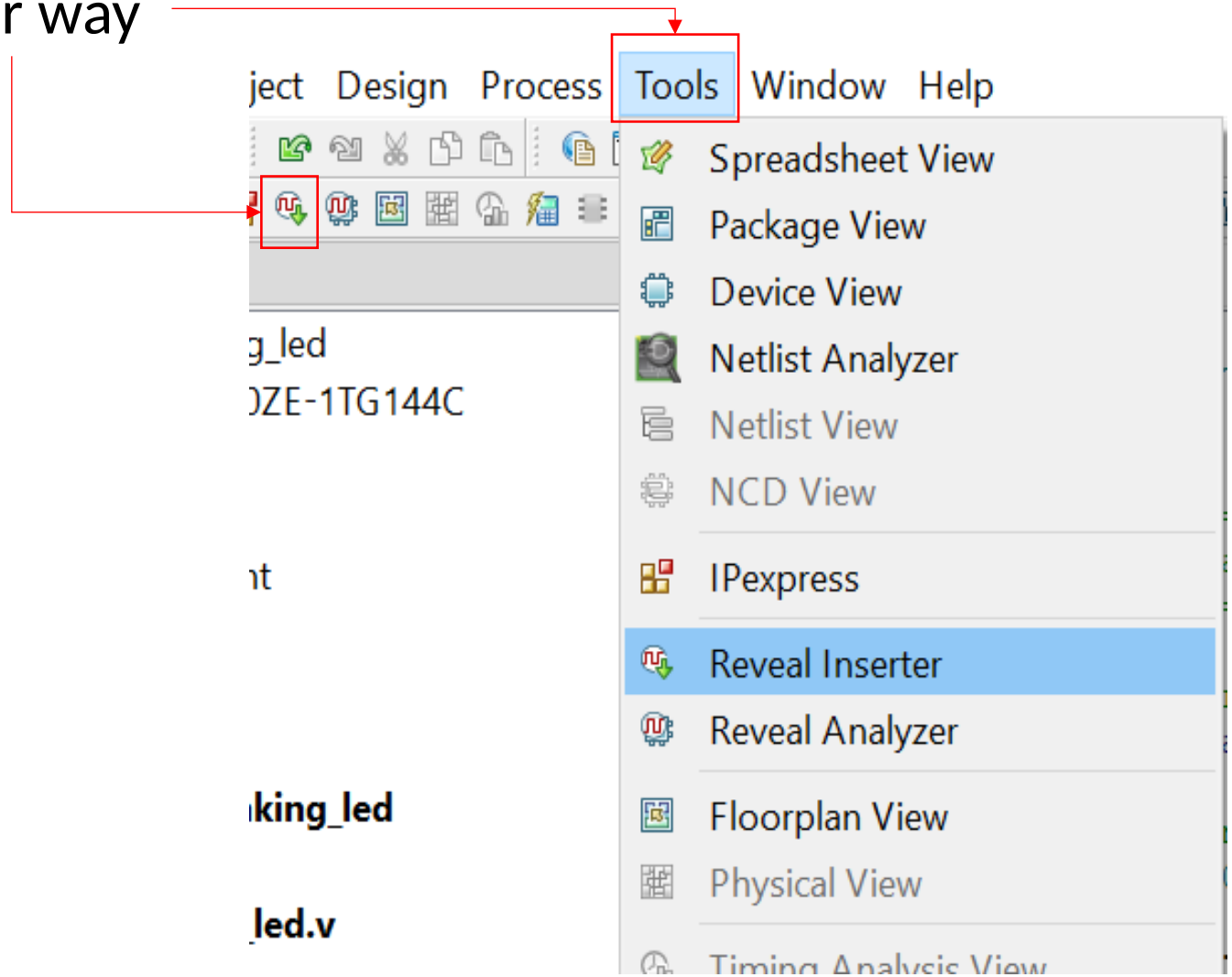




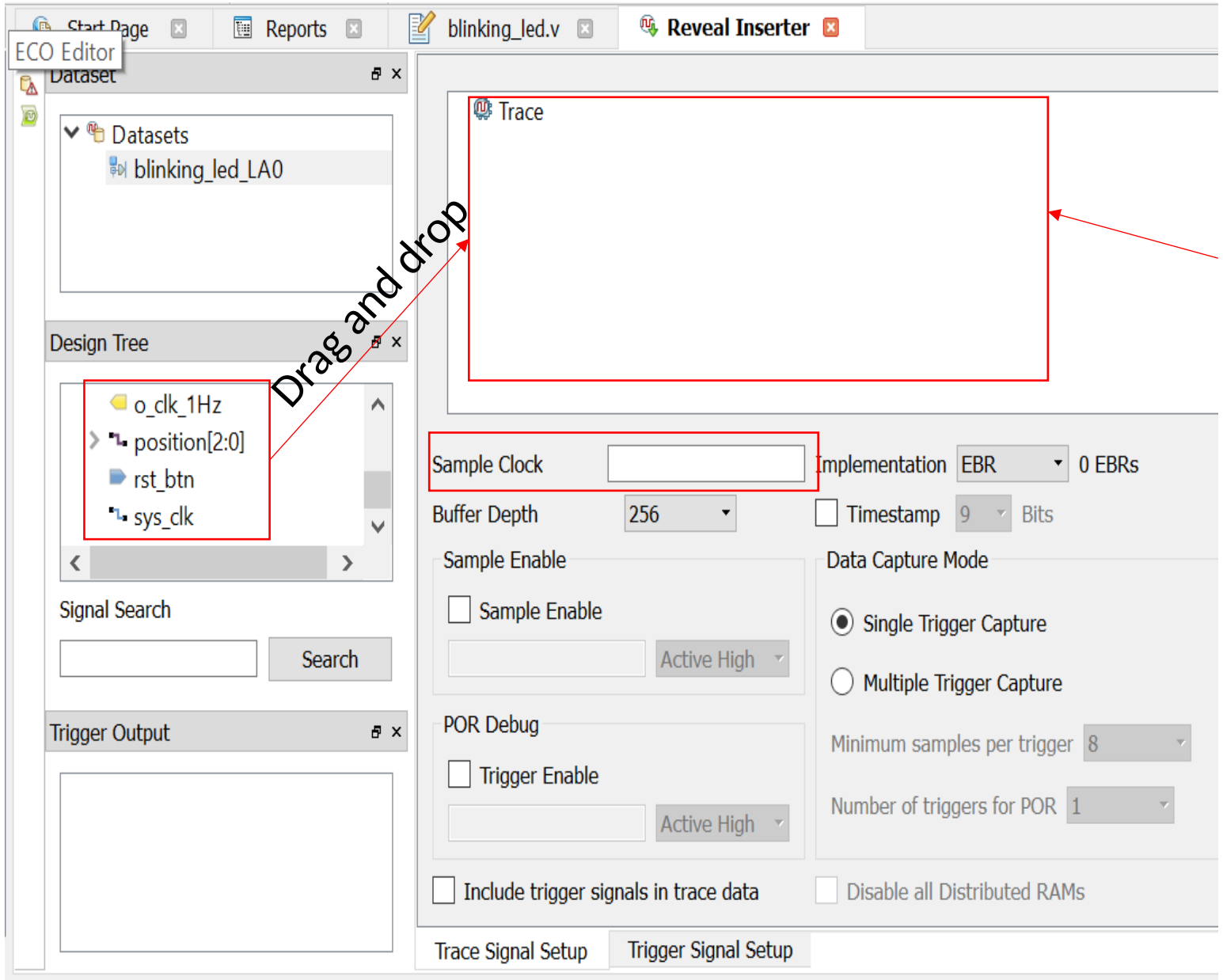
Reveal

Reveal

Either way



Reveal

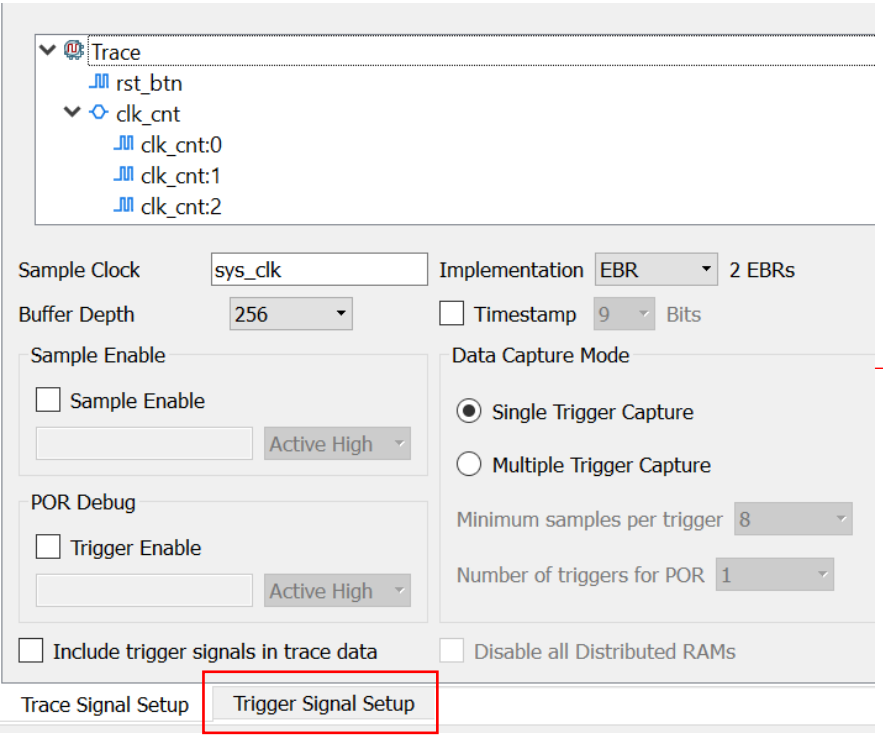


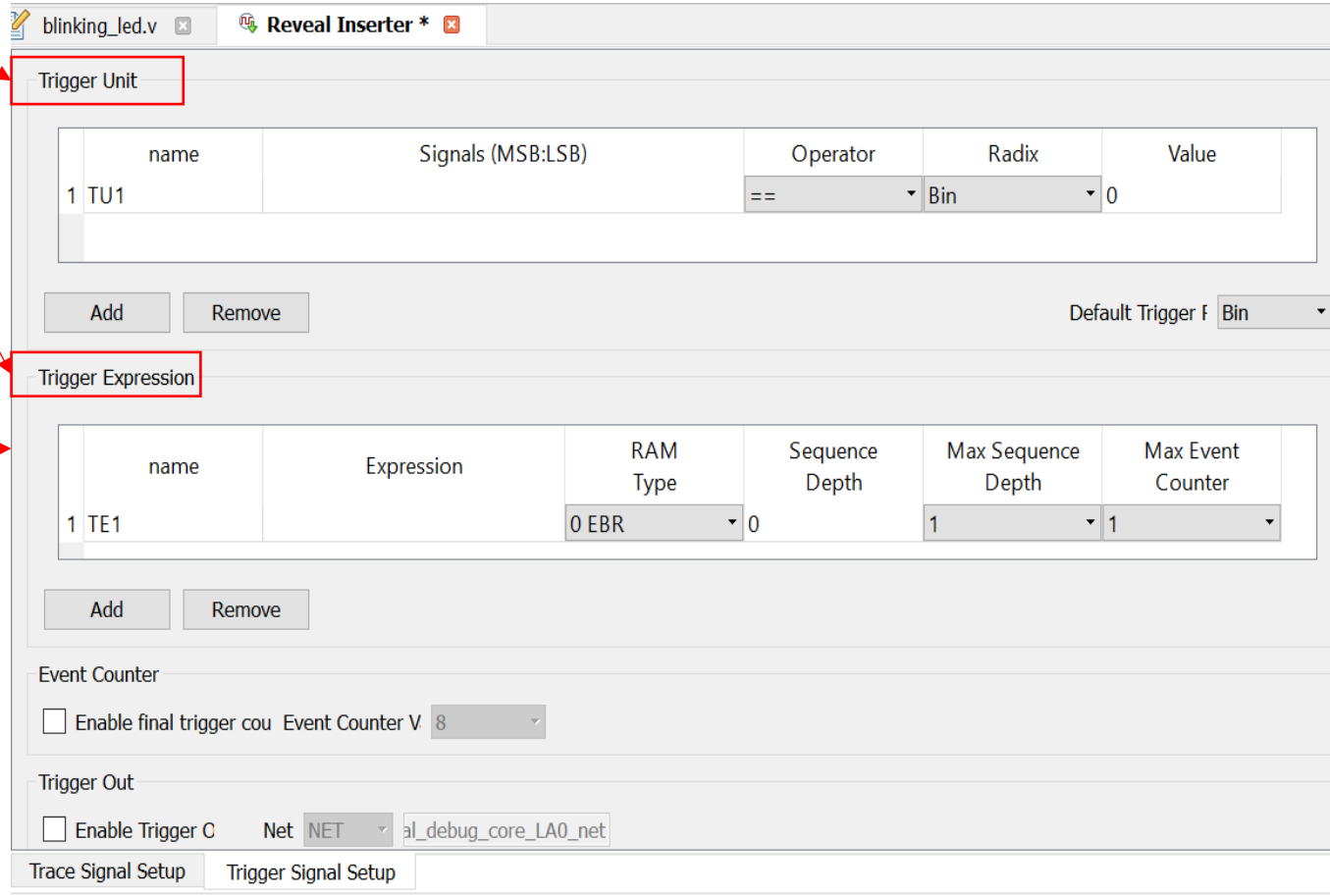
Signals you want to look at

The “Sample Clock” is the clock for Reveal tool (must run faster or equal JTAG clock)

Reveal

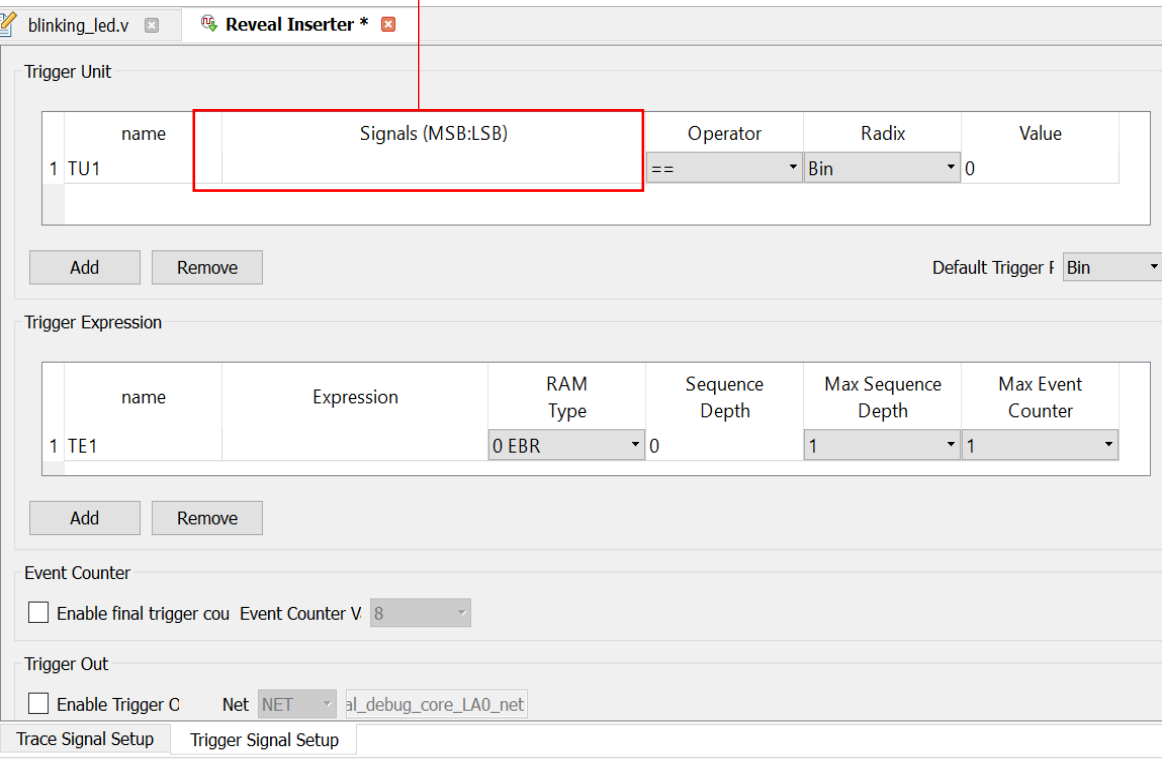
Trigger types

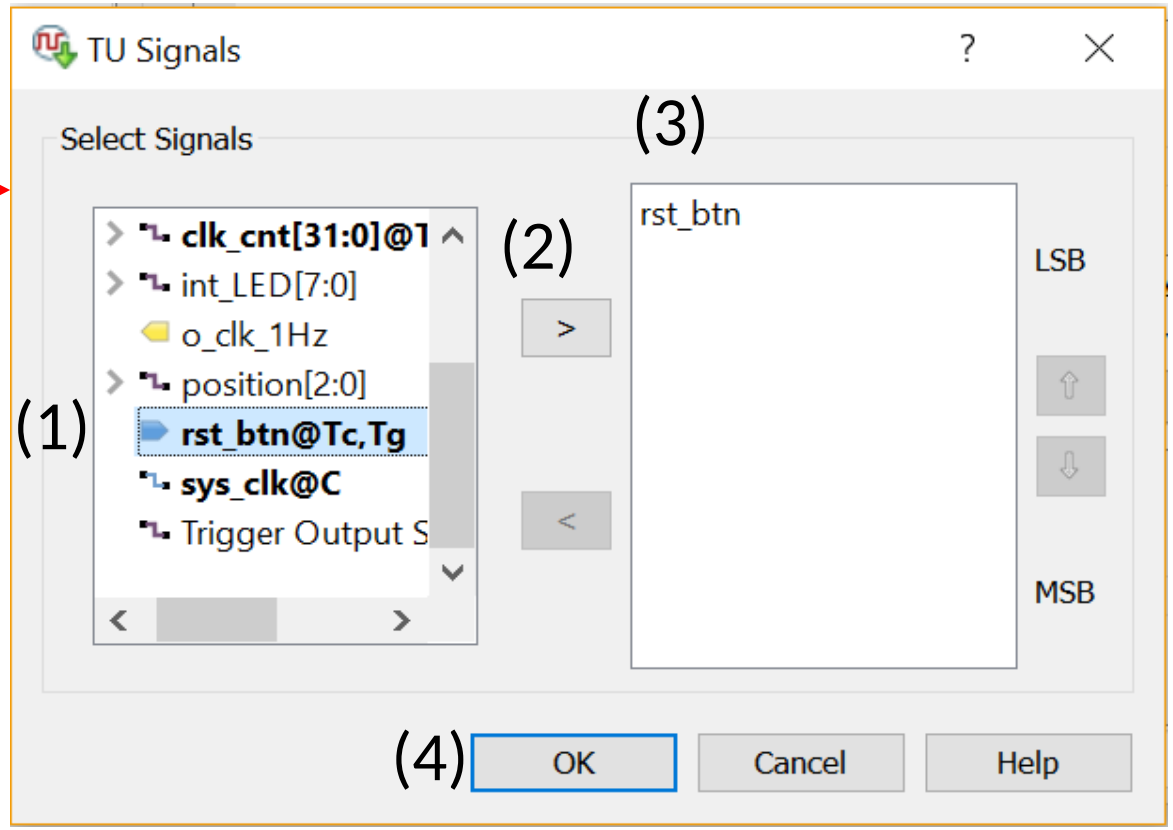




Reveal

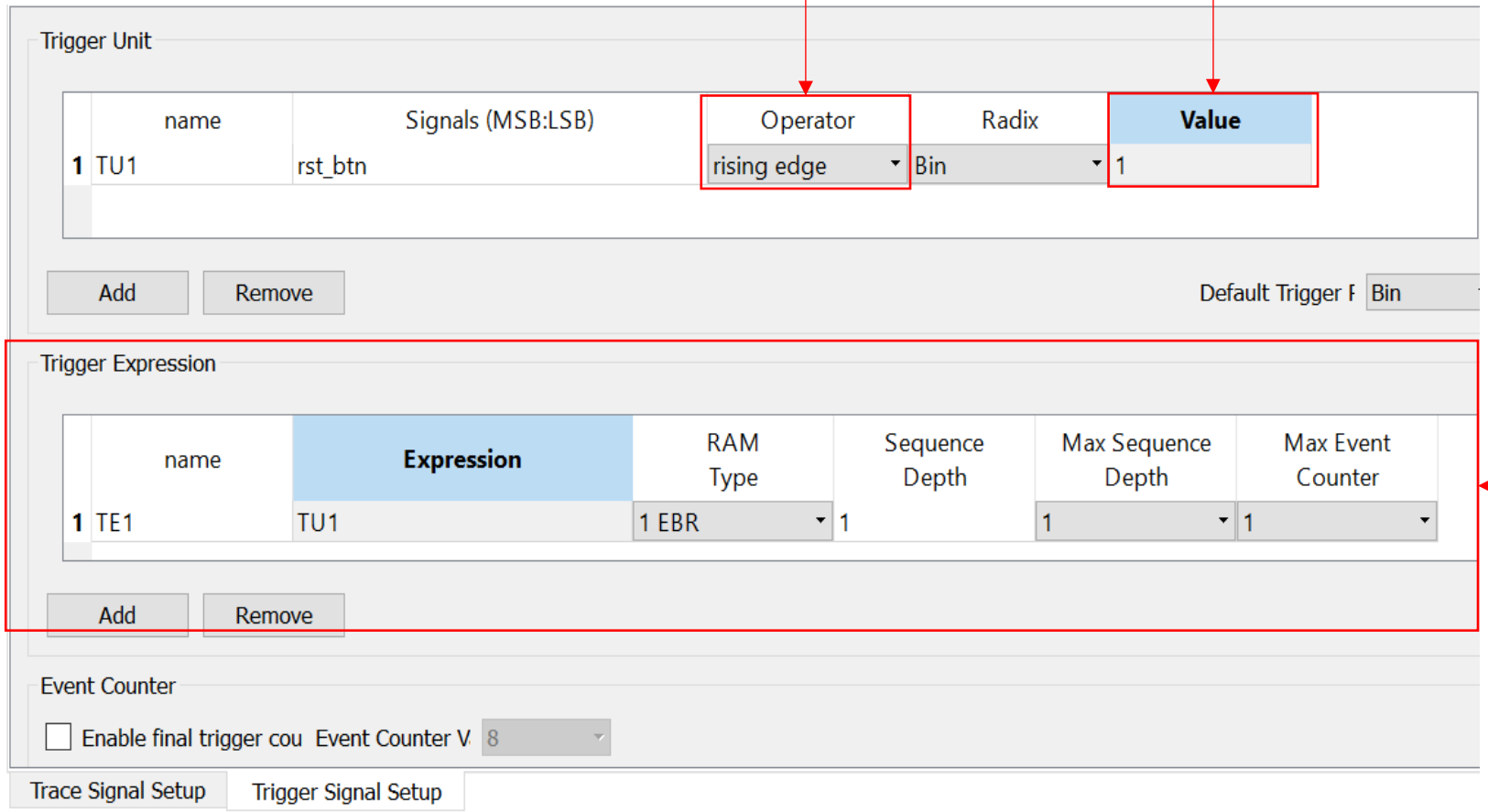
Double Click





Reveal

Set trigger on rising edge

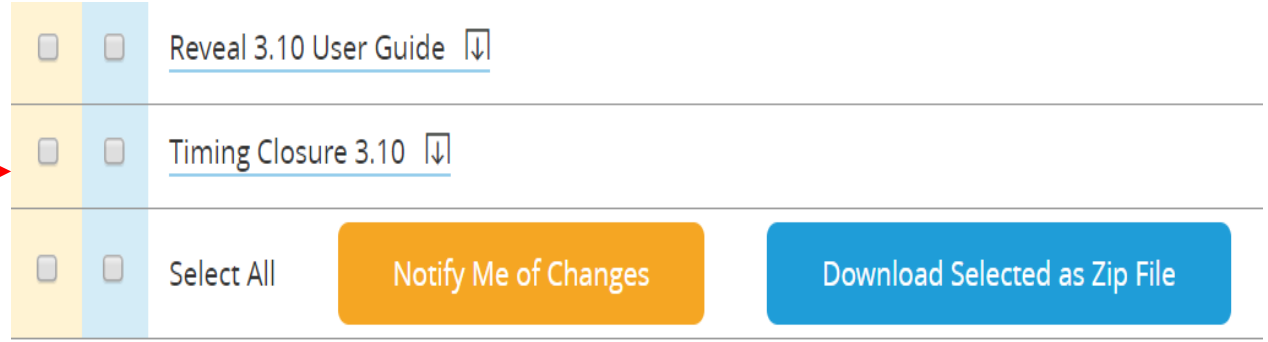


The “Value” will indicate what bit control the trigger. For example, if the signal is 4-bit type, setting “Value” to “**1100**” will tell the Reveal to trigger on the **rising edge** of the **2 MSB**.

Powerful option, but we don’t use it in this tutorial. Setting **TU1** to be the only trigger unit in Expression

Reveal

http://www.latticesemi.com/en/Products/DesignSoftwareAndIP/FPGAandLDS/LatticeDiamond.aspx



Page 31

Operators You can use the following operators to connect trigger units:

- & (AND) – Combines trigger units using an AND operator.
- | (OR) – Combines trigger units using an OR operator.
- ^ (XOR) – Combines trigger units using a XOR operator.
- ! (NOT) – Combines a trigger unit with a NOT operator.
- Parentheses – Groups and orders trigger units.
- THEN – Creates a sequence of wait conditions. For example, the following statement:

```
TU1 THEN TU2
```

means "wait for TU1 to be true, then wait for TU2 to be true."

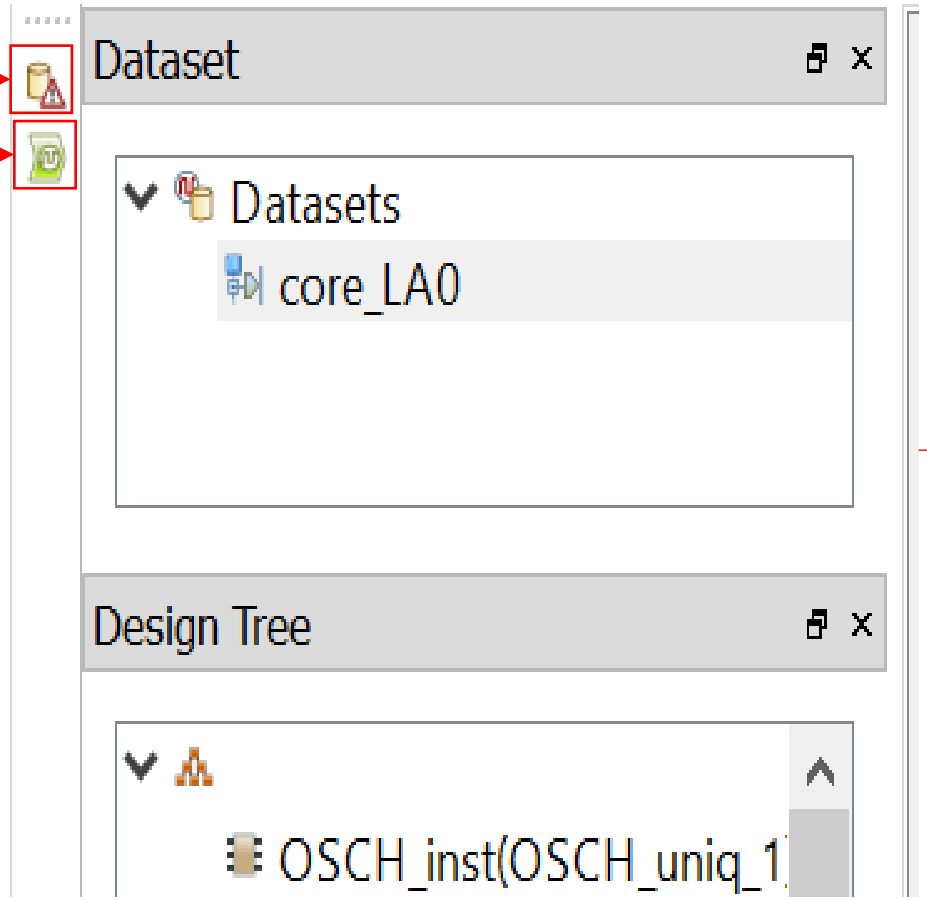
The following expression:

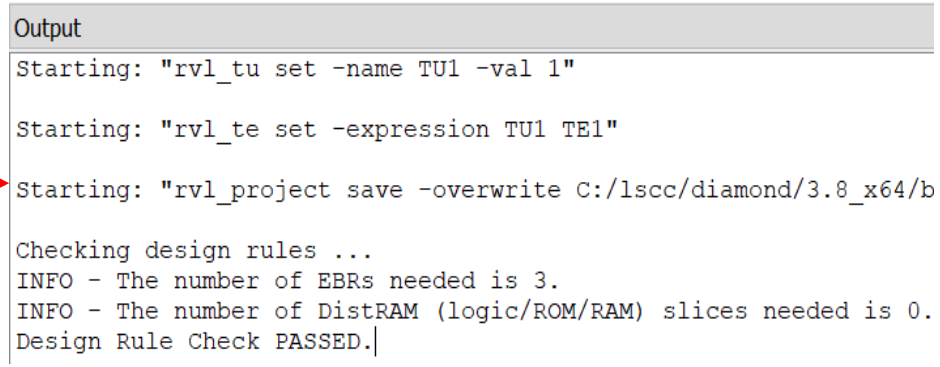
```
(TU1 & TU2) THEN TU3
```

Reveal

Click on “Design Rule Check”

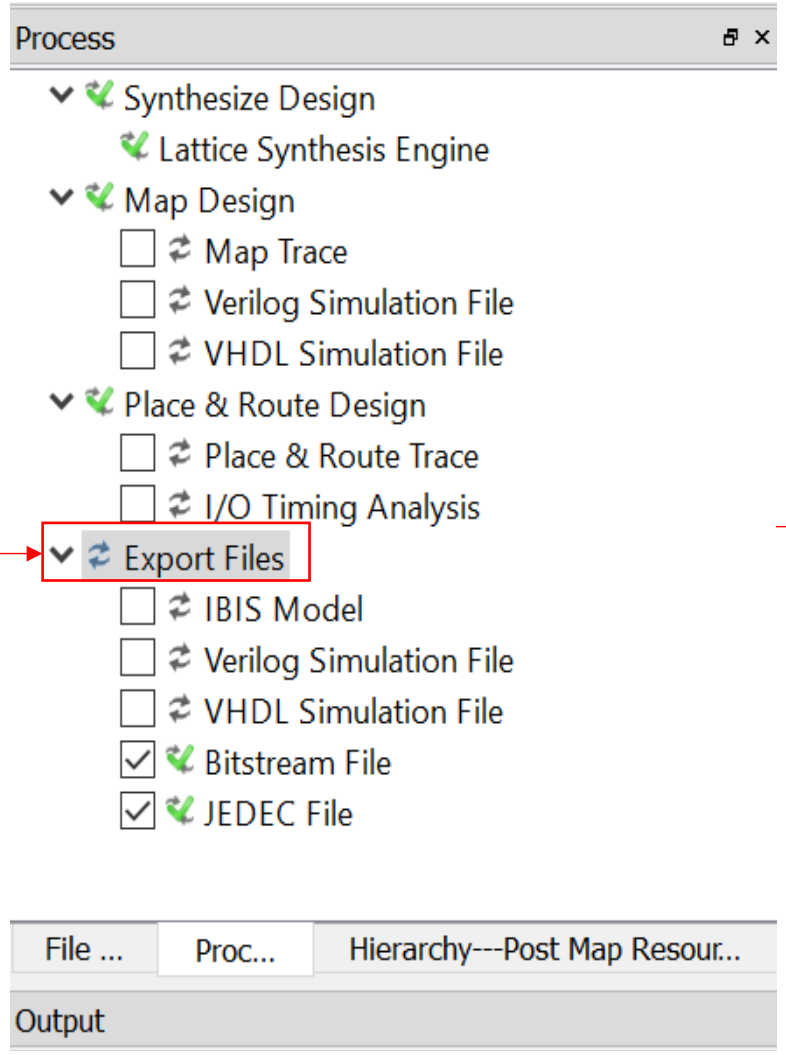
Click on “Insert Debug” after passing the “Design Rule Check”

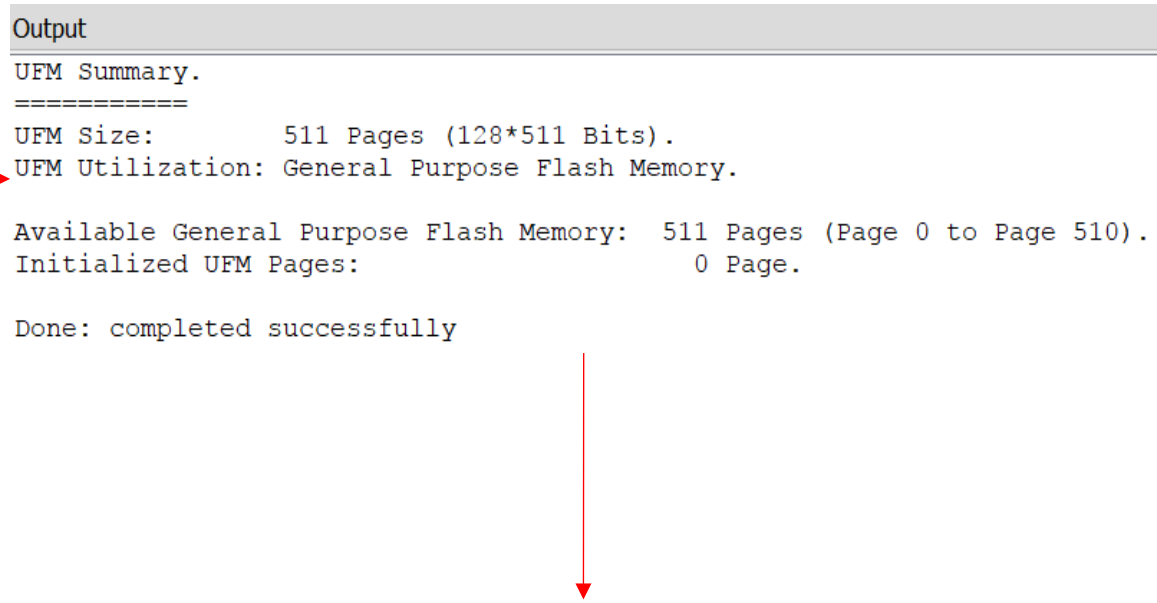




Reveal

Double Click to re-generate the .bit and .jed files

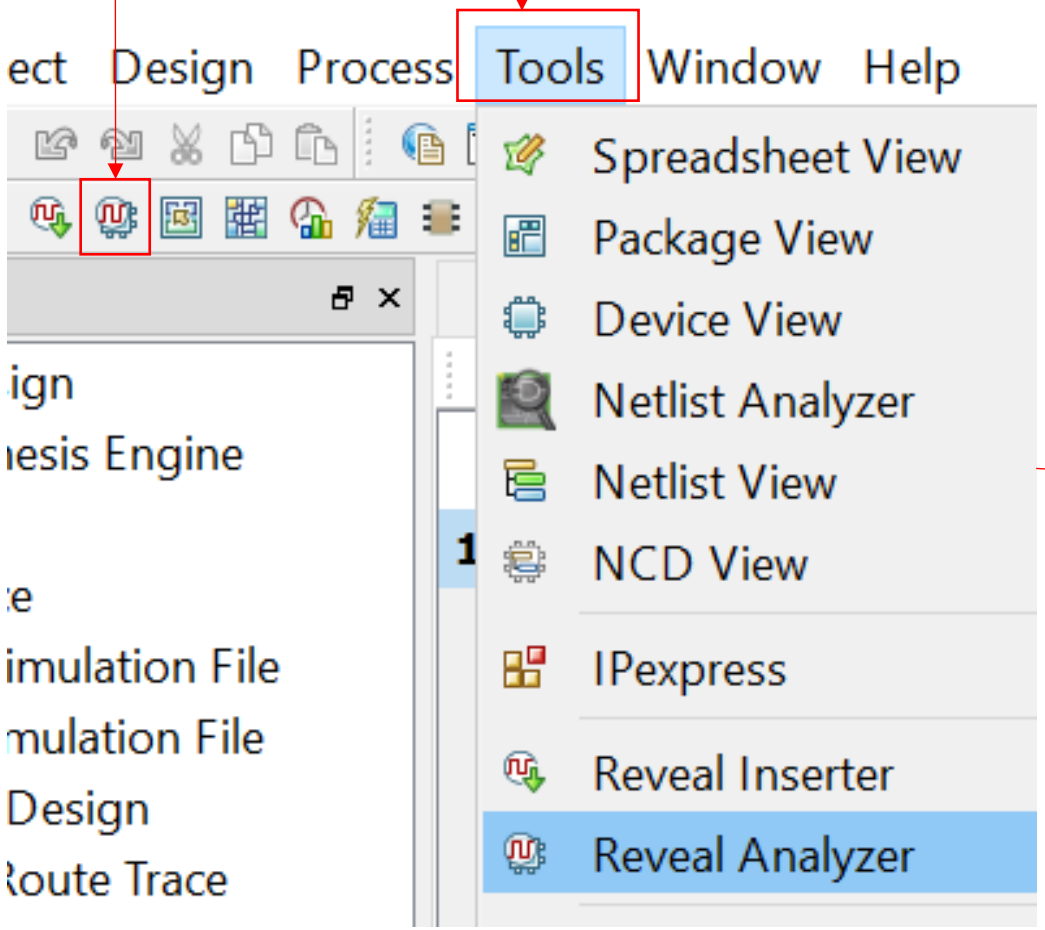


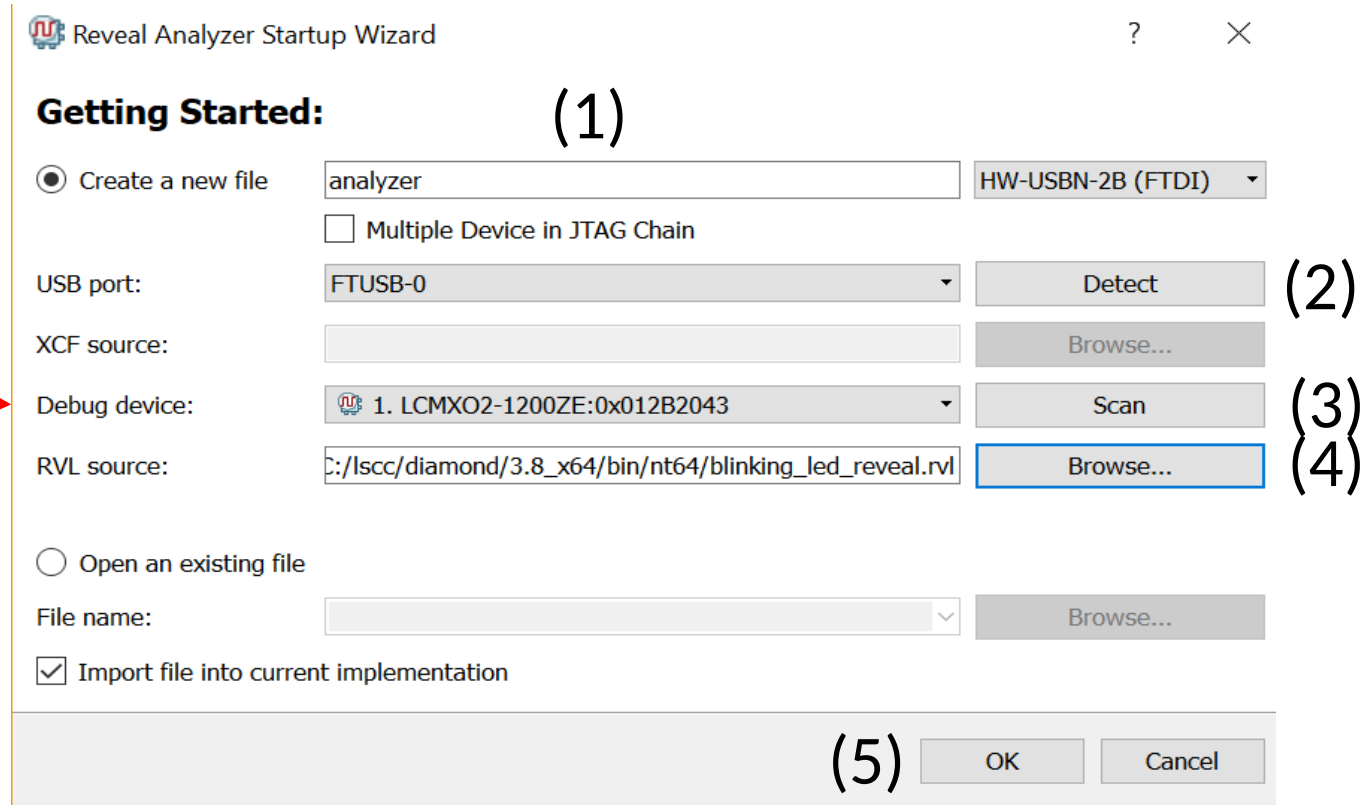


Re-program the MachXO2

Reveal

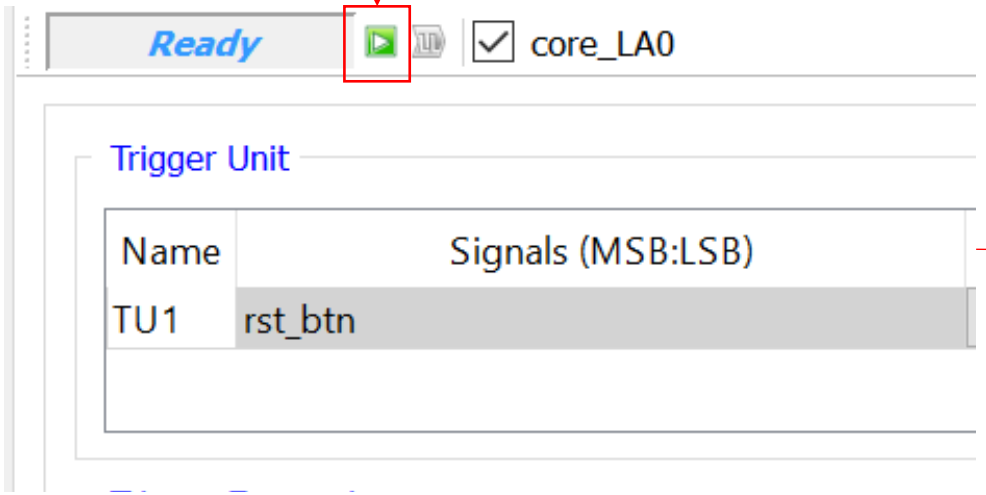
Either way



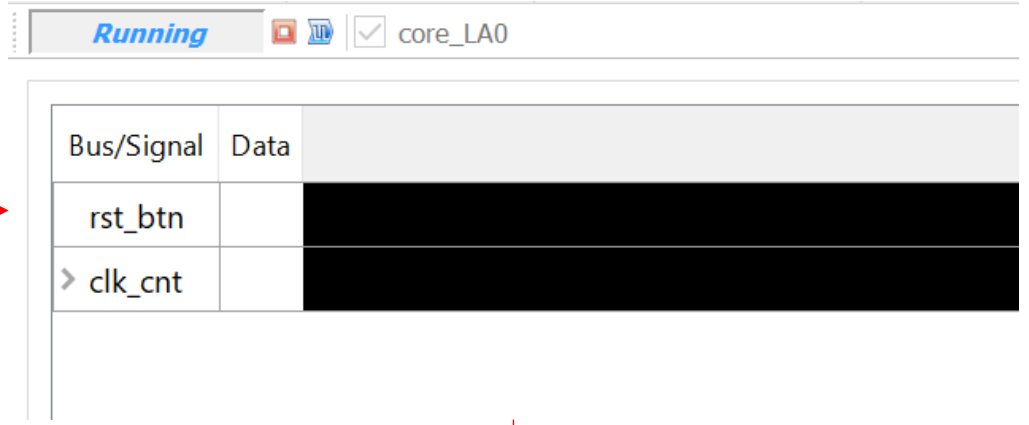


Reveal

Click to run



Wait for trigger signal



Click to trigger again