

**Subject:** COCO simulator – calculator and controller  
**From:** "Richard K. Herz" <herz@ucsd.edu>  
**Date:** 7/25/12 12:32 PM  
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Looking into calculator and controller in COCO – and equivalence to Aspen Plus calculator blocks and design specs

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[http://cocosimulator.org/index\\_sample.html](http://cocosimulator.org/index_sample.html)

SEE THIS EXAMPLE – FROM WHICH ATTACHED SCREENSHOTS ARE TAKEN

controller.fsd (108 kB)

<http://cocosimulator.org/down.php?dl=controller.fsd>

COFE, COUSCous, TEA This example measures reactant flow at the inlet and outlet of a PFR reactor. The measurements are used to calculate the reactant's conversion. A controller is used to modify the reactors length to obtain a specified conversion.

The example demonstrates use of a reaction package, measuring units, an information calculator and a controller. It also demonstrates the use of embedded reports and reactor profile graphs.

An alternative version (111 kB) of this flowsheet shows how to control by manipulating a feed flow.

preview...

<http://cocosimulator.org/down.php?dl=controller.fsd>

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In this example, information streams from the reactor feed stream and outlet stream are input to a calculator and used to calculate conversion across the reactor. The output info stream from the calculator is sent to the controller. The controller is given a setpoint value. The output info stream of the controller is fed to the reactor as an info stream controlling the reactor length. So the controller varies the reactor length in order to achieve the setpoint value.

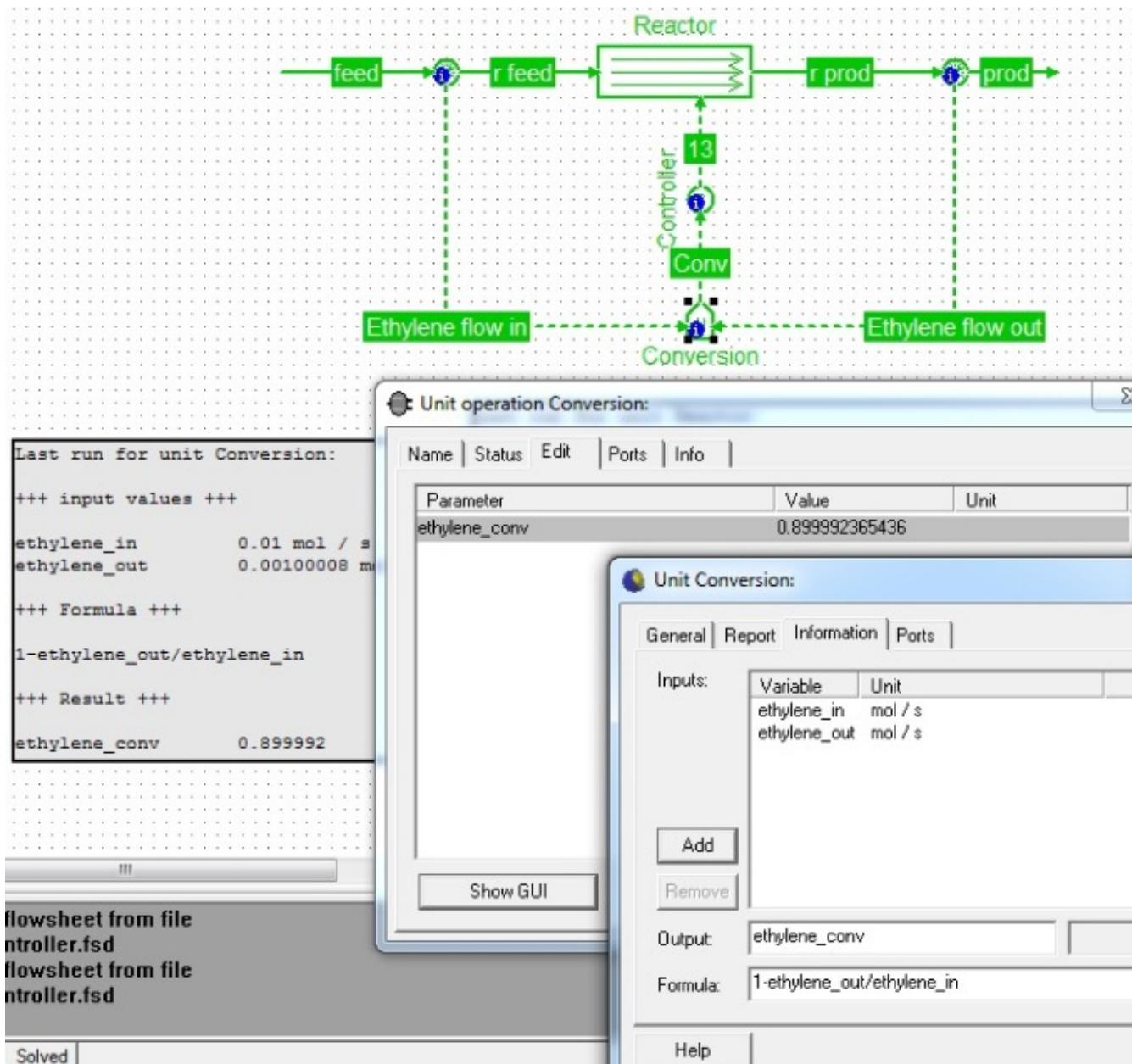
The calculator is the InformationCalculator unit operation. So in COFE, insert unit operation, select Information > InformationCalculator. You attach information inputs and output and enter an equation. See attached screen shots "calculator – insert.jpg" and "calculator – equation.jpg"

The controller has a separate listing on the insert menu list. You attach information inputs and output and enter a setpoint. See attached screen shots "controller – insert.jpg" and "controller – set point .jpg"

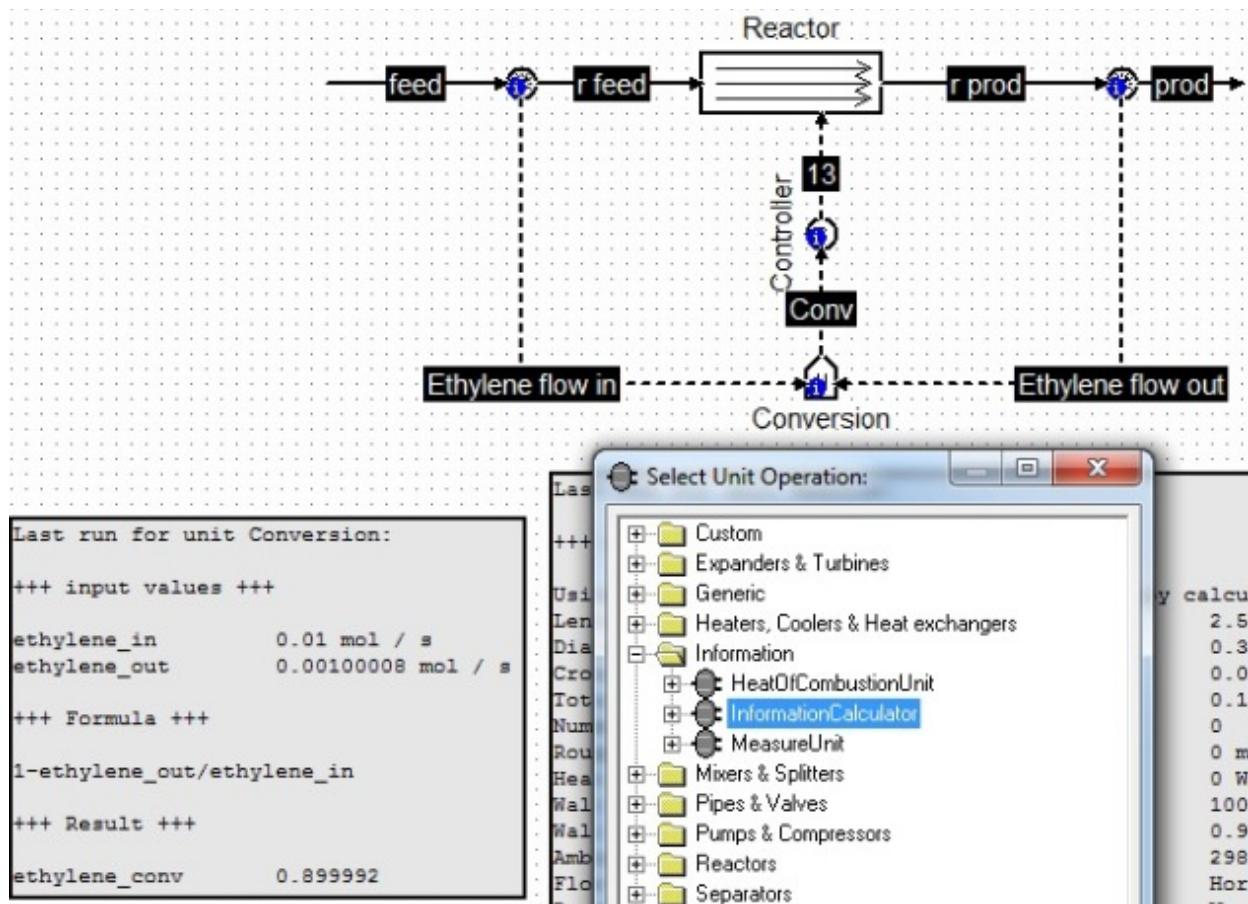
The output of the controller – the manipulated variable – is added to the reactor by going to Ports tab, Port operations menu (lower left), add virtual information port, then in next palette, click Input and select Length. This means that this input will specify the reactor length. This input from the controller will change the reactor length in an attempt to get the conversion to match the setpoint input to the controller from the calculator. See attached screen shot "reactor.jpg".

—calculator–input equation.jpg

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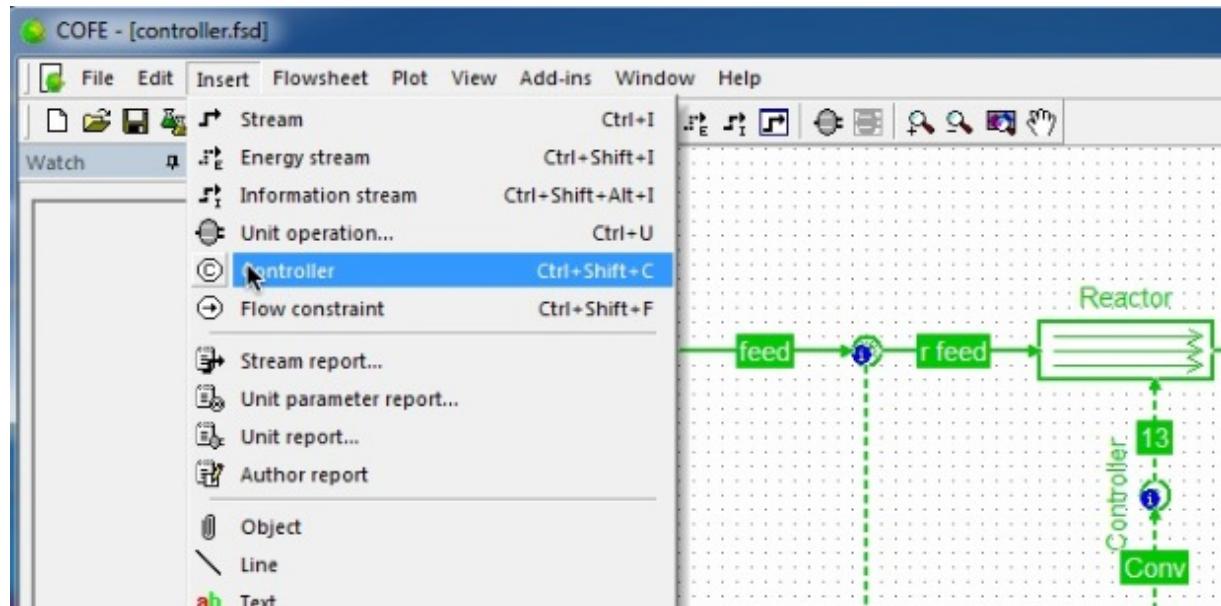
calculator--insert.jpg



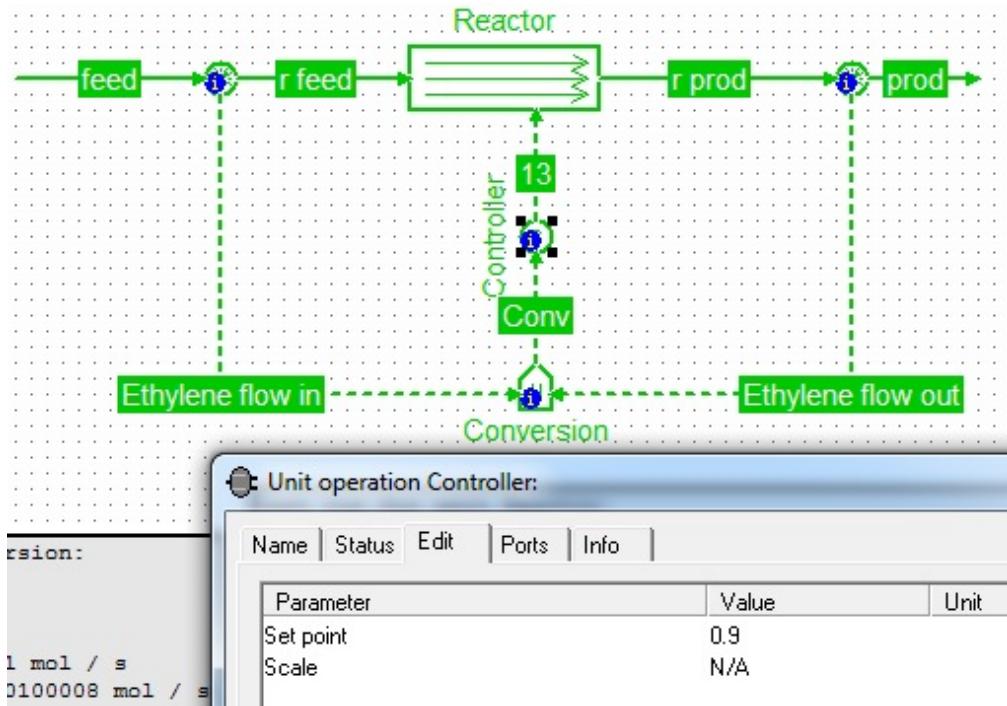

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—controller - insert.jpg

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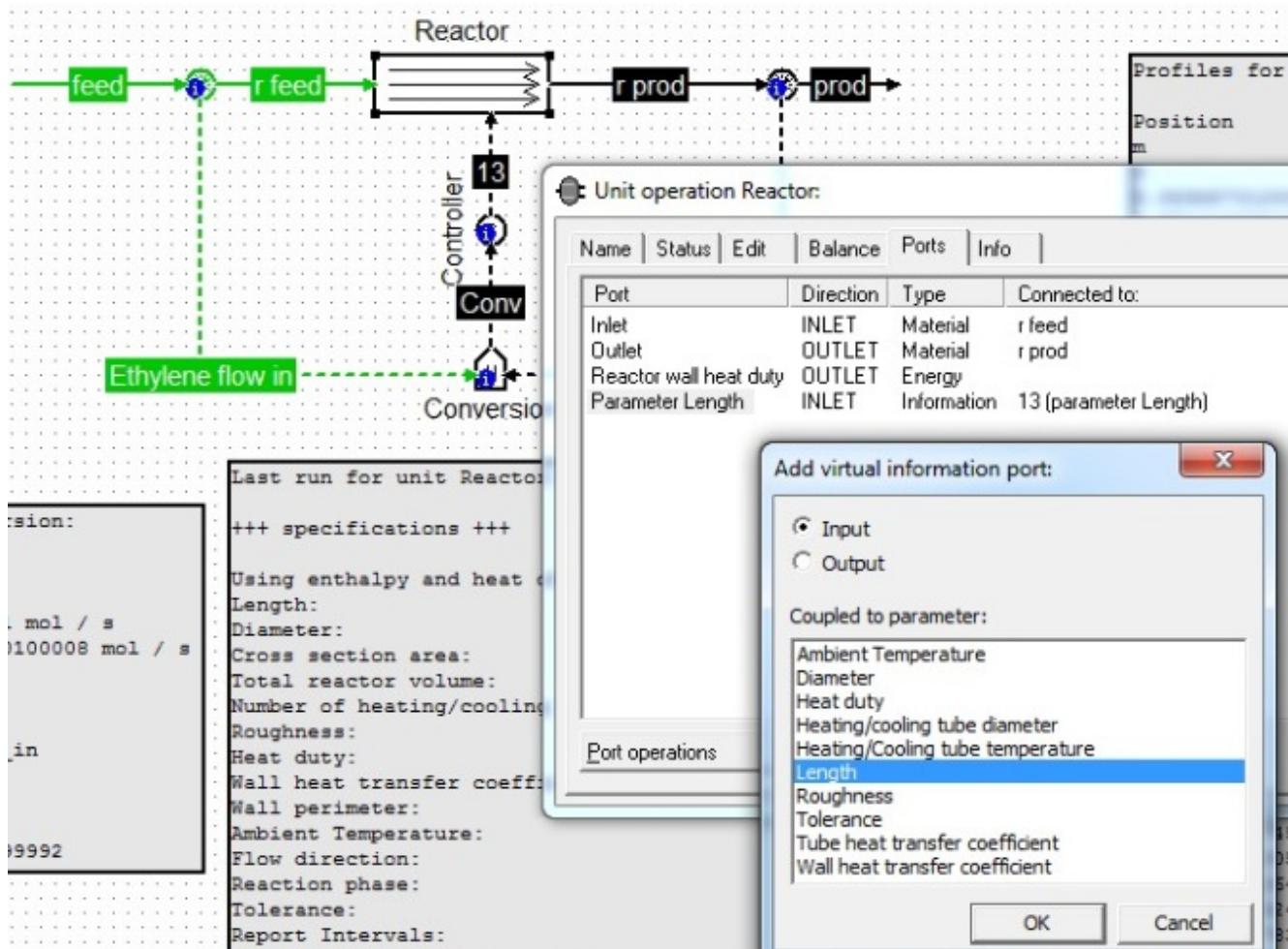


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—controller - set point.jpg—

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—reactor.jpg—

**Attachments:**

calculator - input equation.jpg	166 KB
calculator - insert.jpg	126 KB
controller - insert.jpg	74.7 KB
controller - set point.jpg	93.8 KB
reactor.jpg	130 KB