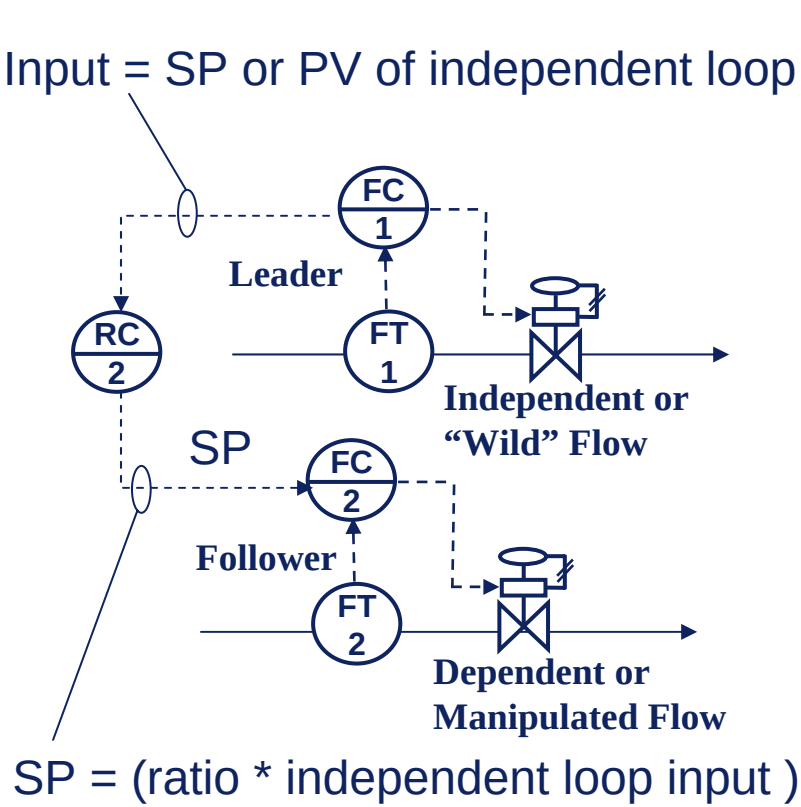
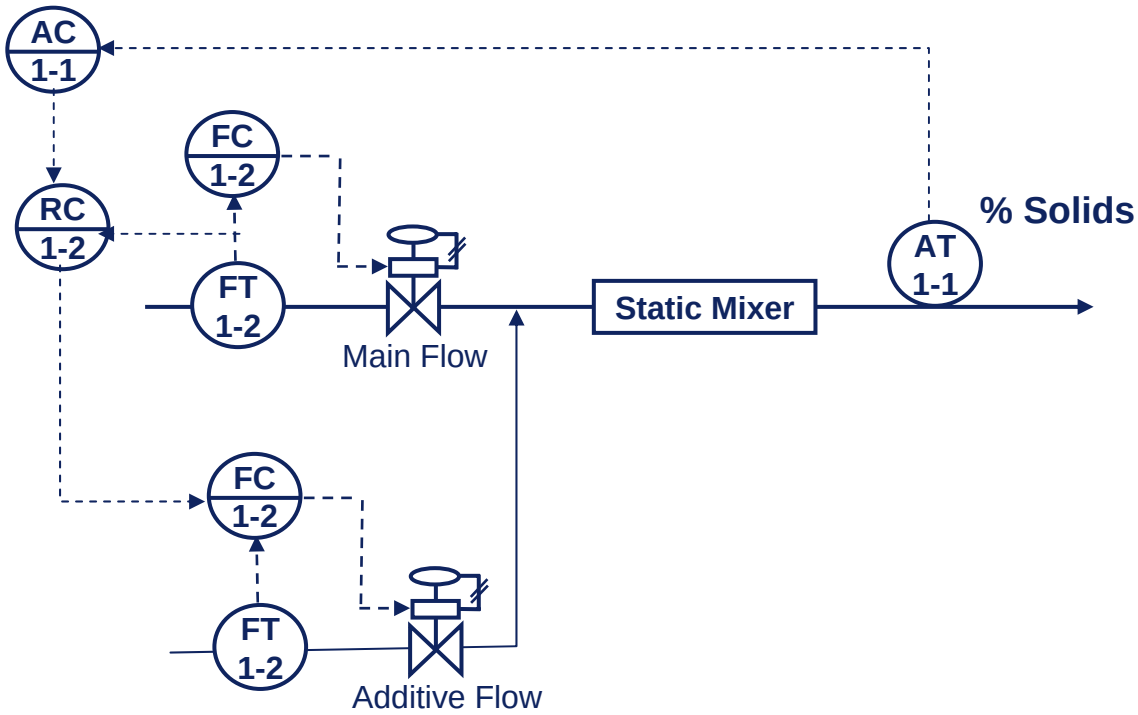
Basic Ratio Control

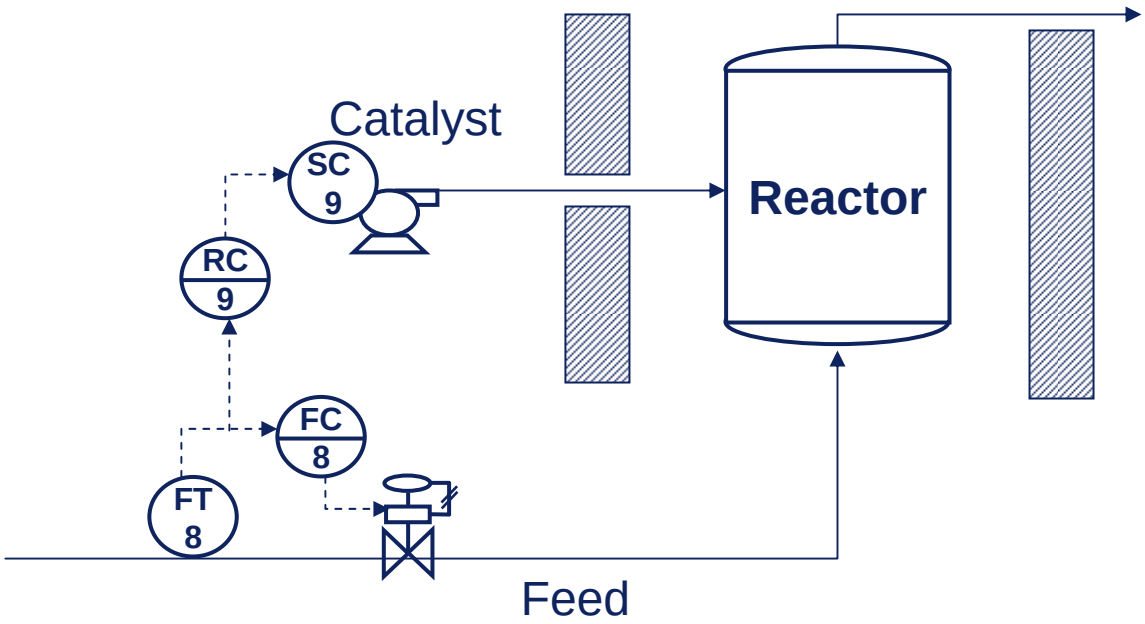


- To fully automate a large process, it is often necessary to provide coordination of multiple flows.
- The technique of ratioing control loops is an effective way to provide this coordination.
- Ratio station is used to specify ratio and to calculate setpoint of the dependent flow.
- Ratioing based on the independent loop setpoint provides a noise free remote setpoint but ***will be incorrect if the independent loop can not maintain its setpoint***

Example - Blend Control

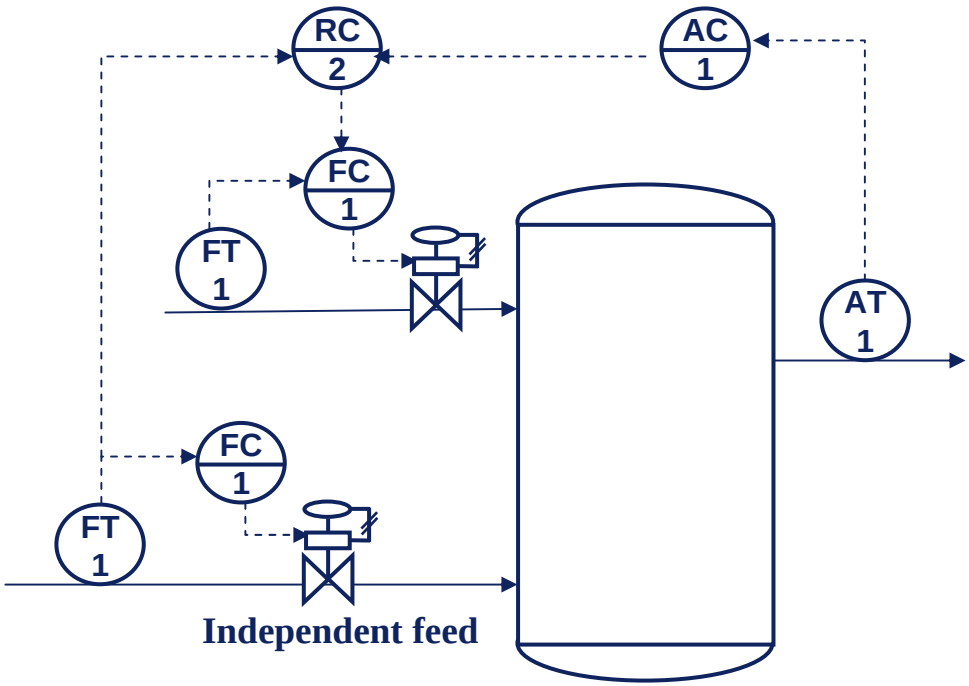


Example – Reactor Feed Ratio Control



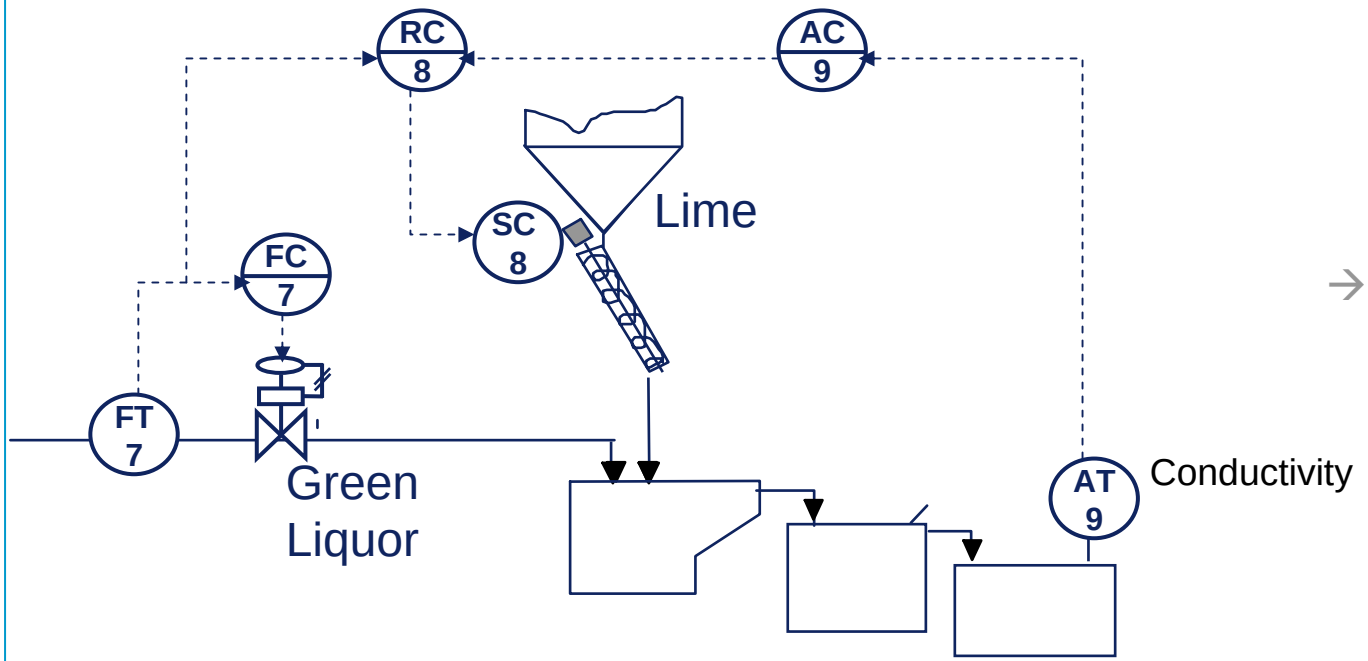
- Catalyst flow must be maintained in correct proportion to the feed flow for correct reactor operation and final product.
- Ratio control automatically provides the correct proportion of catalyst to feed.

Automatic Ratio Adjustment



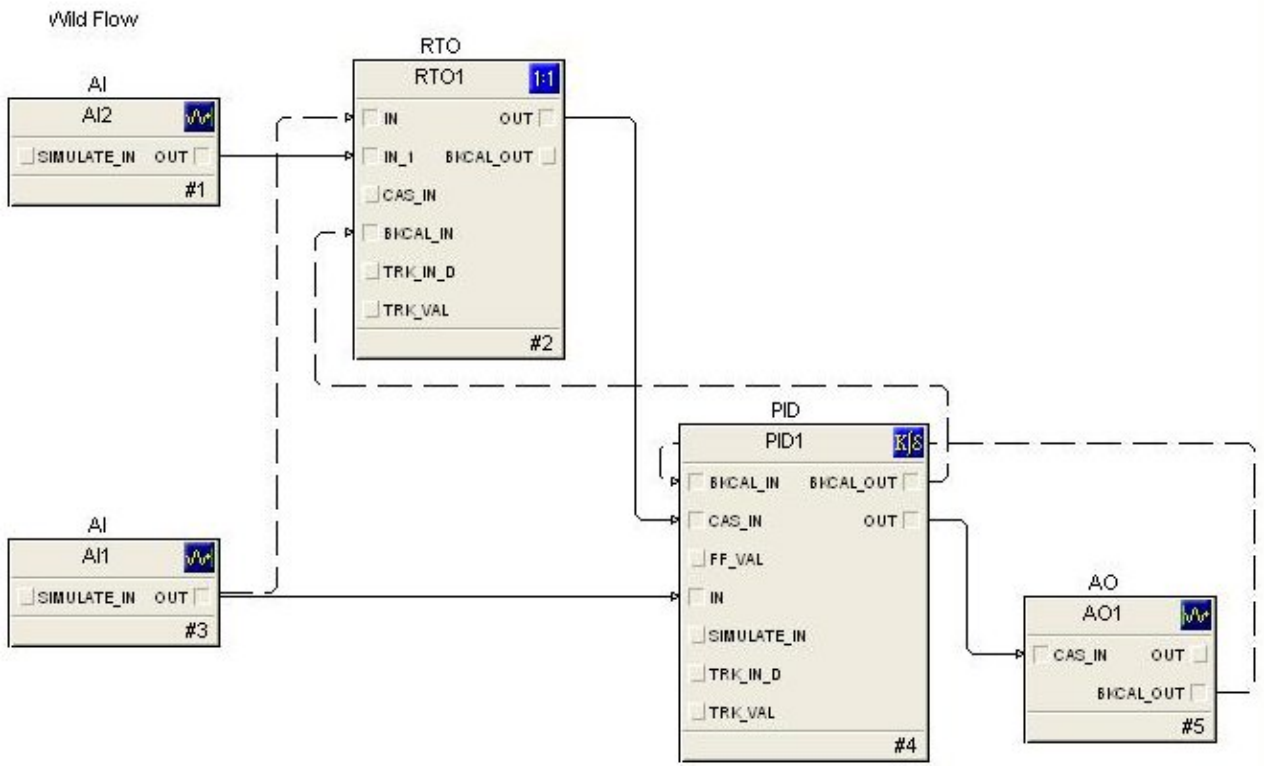
- A process output that indicates the impact of the ratio of process inputs may be maintained at target by using feedback to adjust the ratio target
- To the feedback control, the ratio station and associated flow loops are considered to be part of the process

Example – Slaker Control



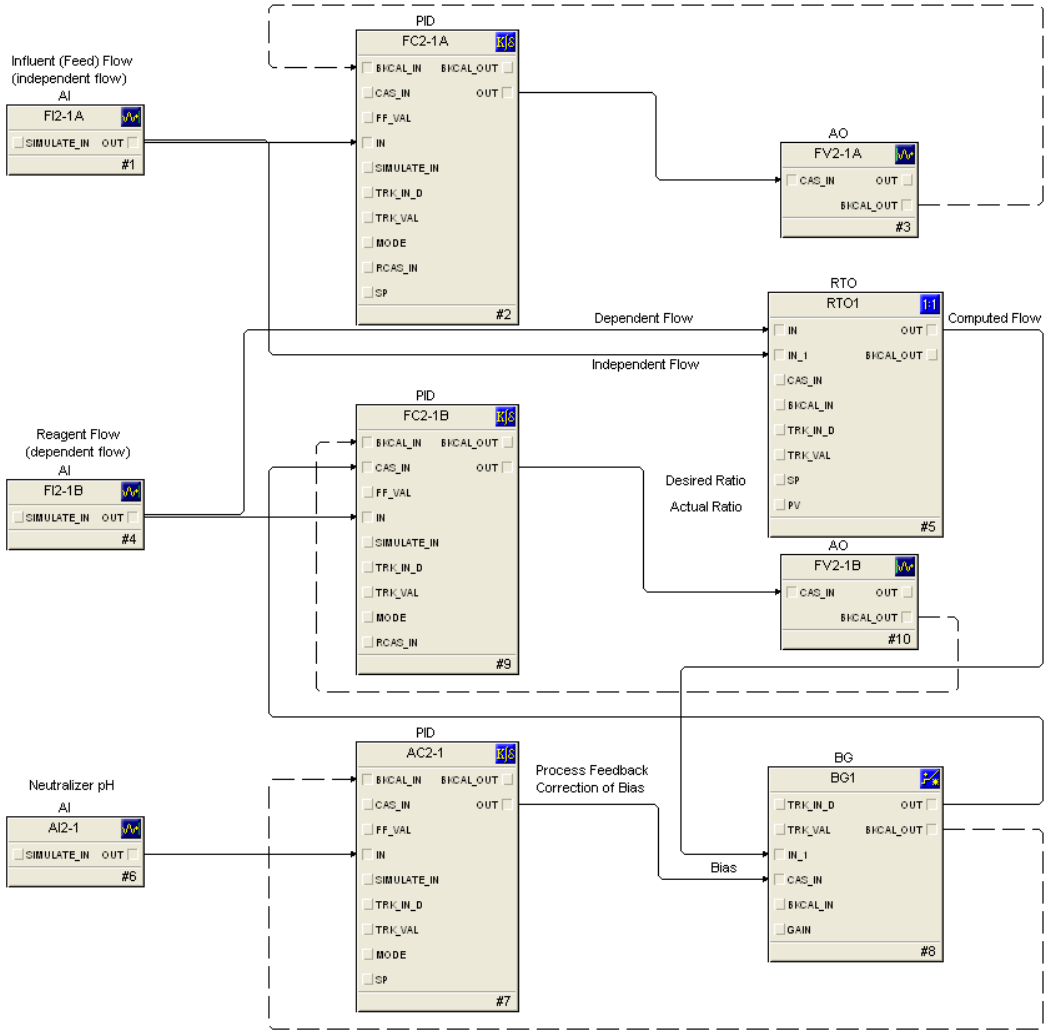
- Effective Alkali. EA, is maintained at target though the adjustment of lime to green liquor flow ratio.
- As green liquor feed is increased, then lime flow is automatically increase in a proportion to maintain the target EA.

Basic Ratio Control

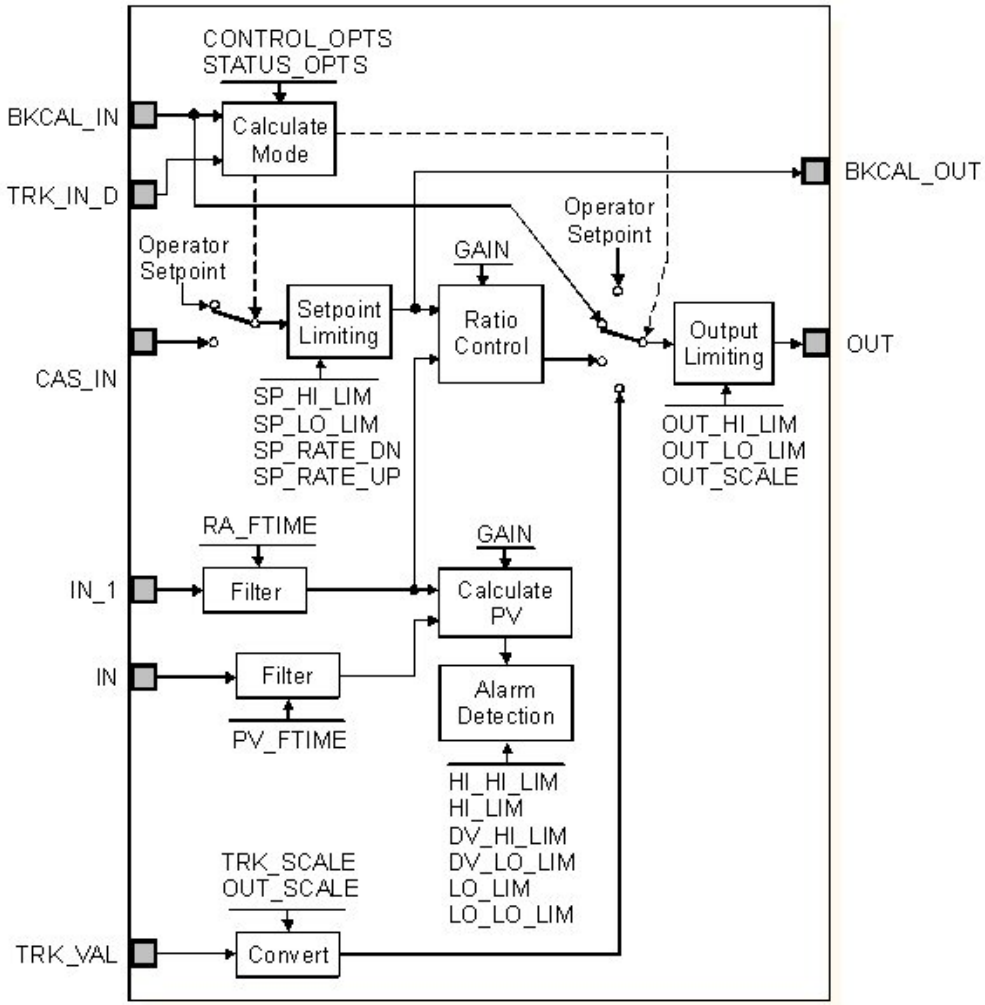


- The Ratio block is used to implement ratio control.
- IN_1 may be a a measurement of a Independent (wild) flow or a setpoint of another loop
- The true ratio is calculated base on IN_1 and IN and reflected in the ratio block PV.

Bias Correction of Ratio Control



Ratio Block Function in DeltaV



Bias/Gain Block Function in DeltaV