

Recipe control

Recipe Control:

Production Engineer is able to:

- ☑ Configure production sequence
- ☑ Setup batch data recording
- ☑ Production planing
- ☑ Produce products with different options

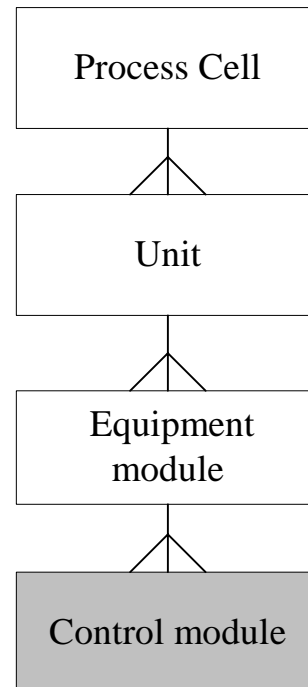
Educational Goals

- ☑ You can explain the major concepts of recipe control
- ☑ You can configure a recipe
- ☑ You know how to use general transition conditions

Topics

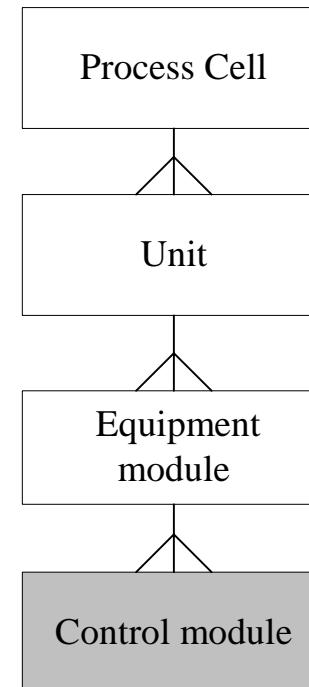
- ☑ Model for plant control
- ☑ Equipment module control
- ☑ Recipe control

Physical Model



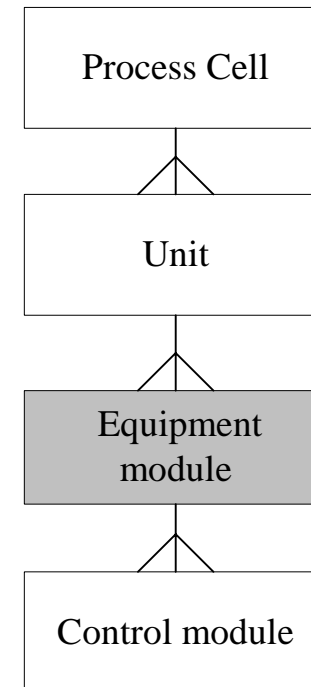
Control module

- ☑ Control of a device
- ☑ Example:
 - Motor control
 - Servo feedback control
 - Sensor



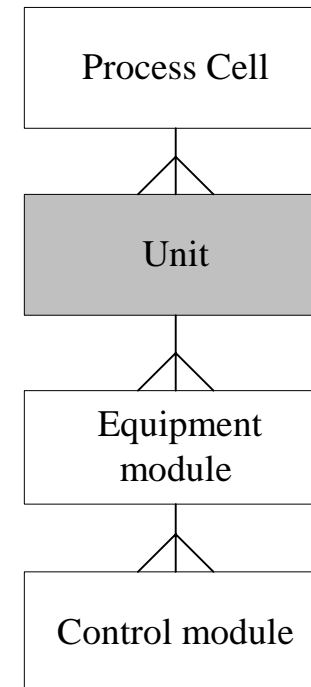
Equipment module control

- ☑ functional group of equipment that can carry out a finite number of specific processing activities.
- ☑ Control unit of a modular plant
- ☑ Know-How ,entity‘
- ☑ Testable unit



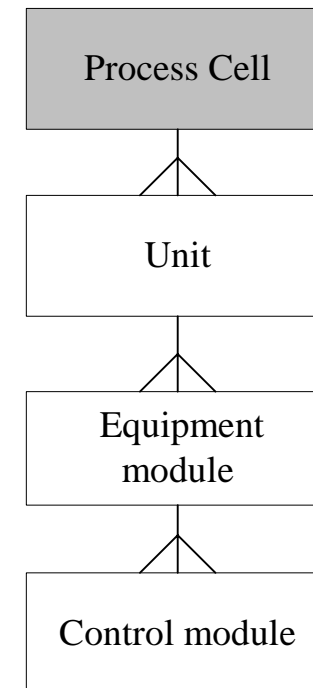
Unit Control

- ☑ A unit is a collection of Equipment Modules that can carry out one or more processing activities
- ☑ Usually a recipe execution system

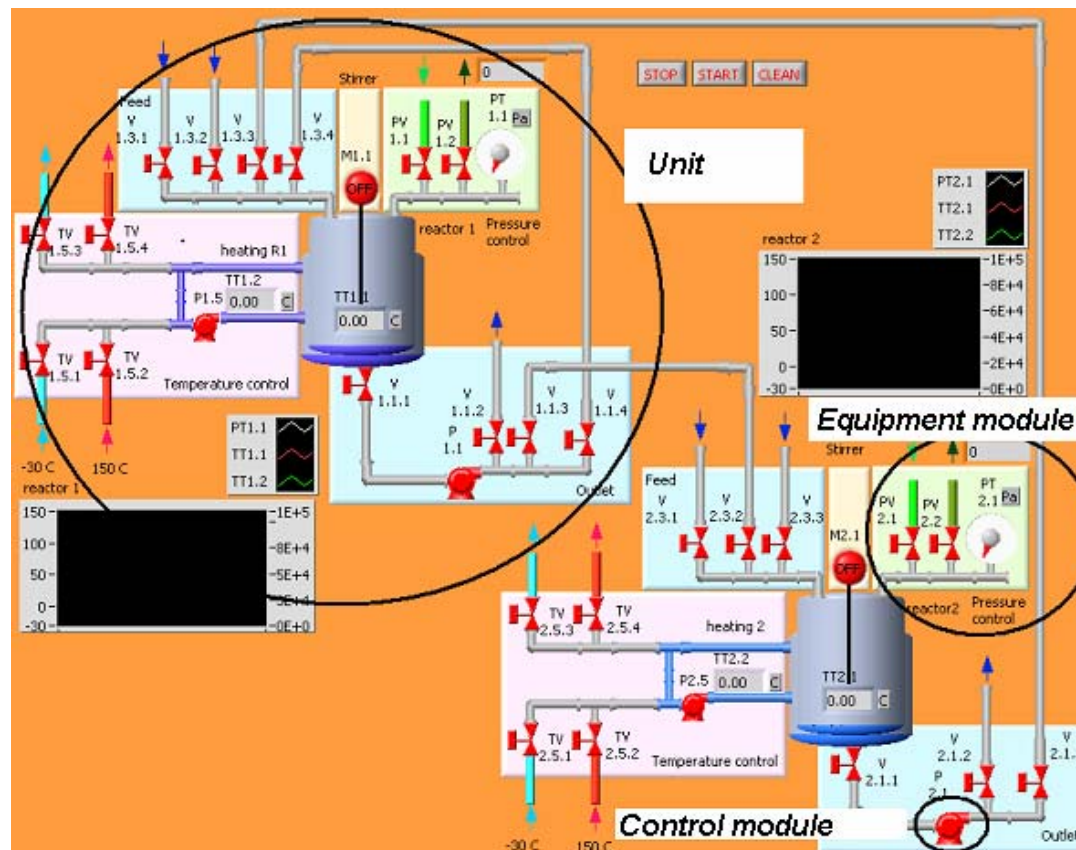


Process Cell Control

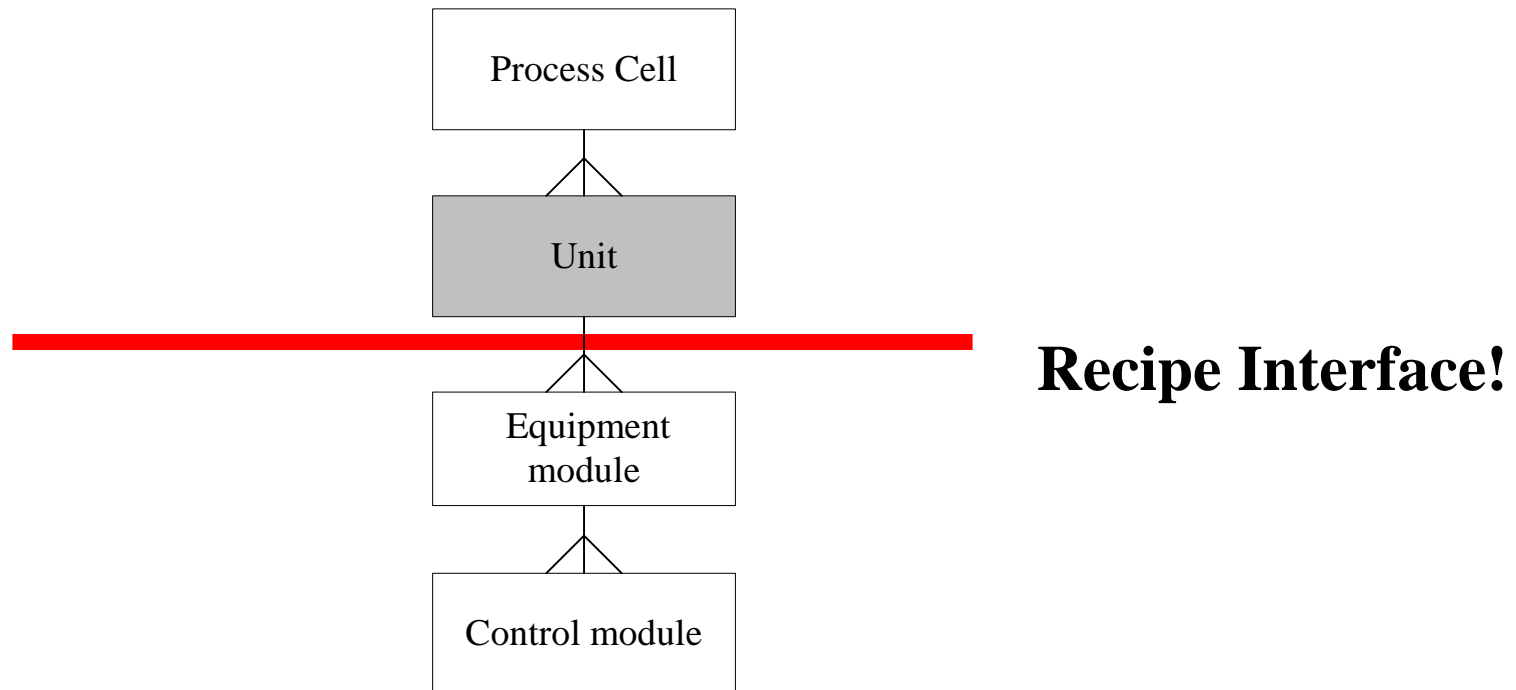
☑ Coordination of Units



Example



Recipe Control



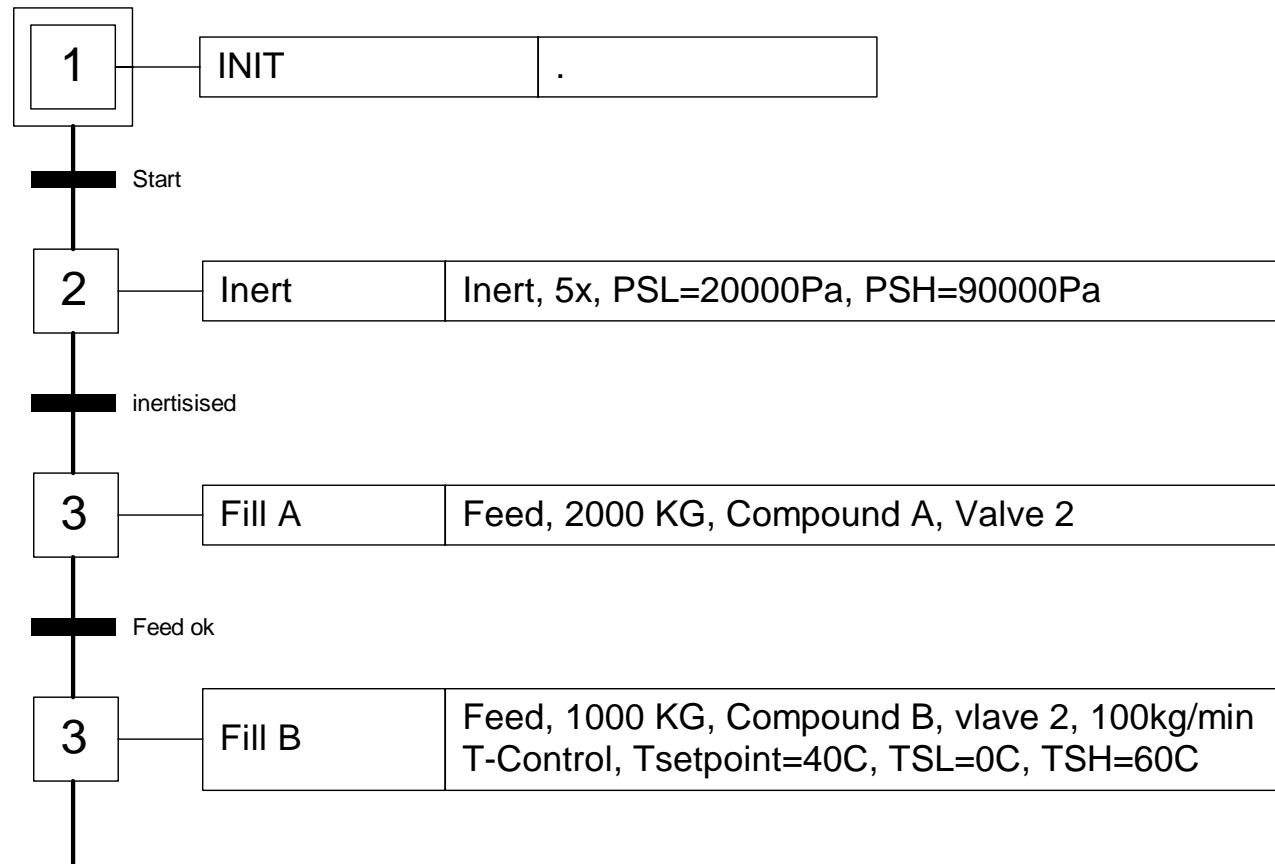
Documentation of equipment module control

- ☑ Build Classes!
- ☑ Define common operation modes
- ☑ Simplify safety functionality
- ☑ Define general go-on condition, i.e. sensible for all operation modes

Example: Temperatur Control

	Processparameter		
Operation Mode A	Description	active Devices	GoOn Condition
0: Off	not active	no	TRUE
1: Wall T- Control	The temperature feedback controller regulates wall temperature Tx.2 to setpoint (Par 3)	T-Control Valve TV x.5.1 - 4	TRUE if T is in range for 5 min
2: Reactor T- Control	The temperature feedback controller regulates reactor temperature Tx.1 to setpoint (Par 3) using a cascaded control structure with wall temperatur control.	T-Control Valve TV x.5.1 - 4	TRUE if T in range for 5 min
3: Reactor T-Control, ΔT limitation	The temperature feedback controller regulates reactor temperature Tx.1 to setpoint (Par 3) using a cascaded control structure with wall temperatur control. Setpoint of the wall temperature controller is limited to $[Tx.1 - \Delta T \dots Tx.2 + \Delta T]$. (ΔT : Par 4)	T-Control Valve TV x.5.1 - 4	TRUE if T in range for 5 min
4: Ramped Reactor T- Control	The temperature feedback controller regulates reactor temperature Tx.1 to setpoint (Par 3) using a cascaded control structure with wall temperatur control. Setpoint of the reaktor temperature controller is ramped with Ramp velocity(Par 5)	T-Control Valve TV x.5.1 - 4	TRUE if T in range for 5 min and final value is attained

A Recipe

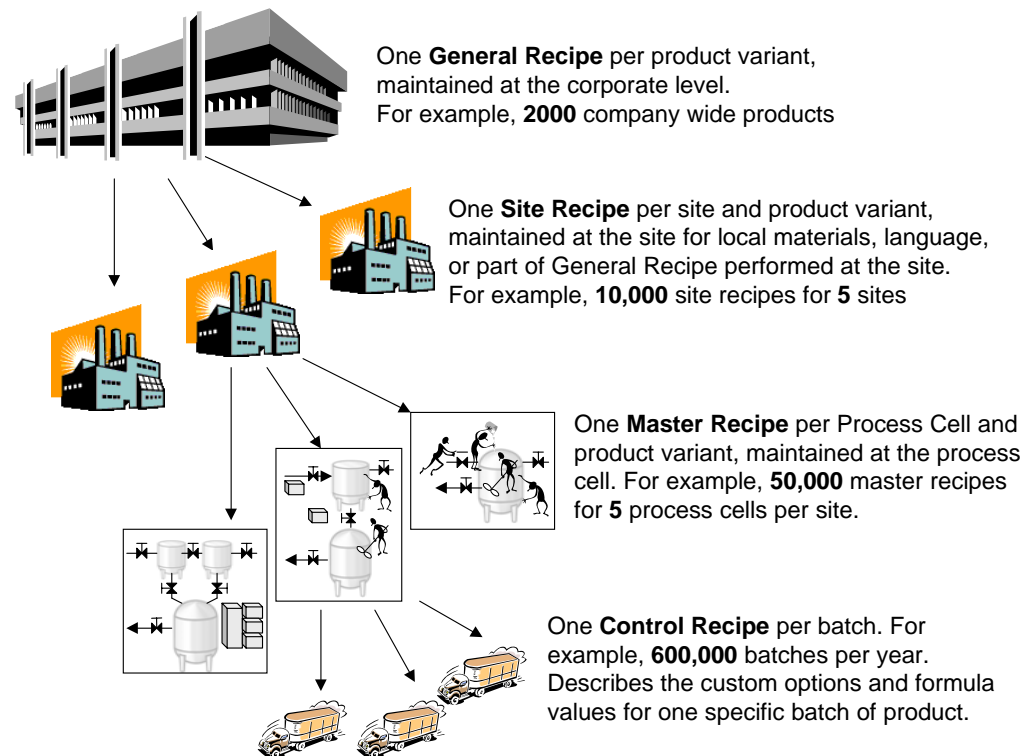


Recipe models

Goal:

- ☑ Plant and Site independent Recipes
- ☑ Site dependent variations are possible

Recipe Model



Recipe model

