

Control Training I

Learn the basics of control engineering interactively using simulated processes. Examine the time behavior of controlled systems, controllers and control loops step by step.

Freely adjustable controller:
P, I, PI, PID,
Two-position controller

Liquid level with P controller

Control quality: 172.6
Gain: 5.0

Practical Training on Control Engineering

| | | |
|--|---|---|
| 1. Liquid level control 1.1 Uncontrolled system 1.2 Closed-loop controlled system 1.3 Examine controlled system 1.4 Closed-loop control with P controller 1.5 Closed-loop control with I controller 1.6 Closed-loop control with PI controller 1.7 Closed-loop control with PID controller 1.8 Closed-loop control with two-pos. controller | 3. Temperature control 3.1 Uncontrolled system 3.2 Closed-loop controlled system 3.3 Examine controlled system 3.4 Closed-loop control with P controller 3.5 Closed-loop control with I controller 3.6 Closed-loop control with PI controller 3.7 Closed-loop control with PID controller 3.8 Closed-loop control with two-pos. controller | 5. Mixing container cascade 5.1 Uncontrolled system 5.2 Closed-loop controlled system 5.3 Examine controlled system 5.4 Closed-loop control with P controller 5.5 Closed-loop control with I controller 5.6 Closed-loop control with PI controller 5.7 Closed-loop control with PID controller 5.8 Closed-loop control with cascade controller |
| 2. Liquid level control with time delay 2.1 Uncontrolled system 2.2 Closed-loop controlled system 2.3 Examine controlled system 2.4 Closed-loop control with P controller 2.5 Closed-loop control with I controller 2.6 Closed-loop control with PI controller 2.7 Closed-loop control with PID controller 2.8 Closed-loop control with two-pos. controller | 4. Temperature control with time delay 4.1 Uncontrolled system 4.2 Closed-loop controlled system 4.3 Examine controlled system 4.4 Closed-loop control with P controller 4.5 Closed-loop control with I controller 4.6 Closed-loop control with PI controller 4.7 Closed-loop control with PID controller 4.8 Closed-loop control with two-pos. controller | 6. Ptn controlled system 6.1 Select controlled system 6.2 Examine controlled system 6.3 Closed-loop control 6.4 Closed-loop control 6.5 Closed-loop control 6.6 Closed-loop control |
| 7. Controller behaviour 7.1 P controller 7.2 I controller 7.3 PI controller 7.4 PID controller | | |

Temperature control with PI controller

Setpoint: 100.0 °C
Actual value: 51.9 °C
Control deviation: -48.1 °C

Heating power kW: 33.4

Mixing container cascade with cascade controller

Setpoint: 10 g/l
Actual value: 5.4 g/l
Control deviation: -4.6 g/l

- Examine:
- Manual control
 - Controller behavior
 - Control system behavior
 - Control loop behavior
 - Control loop optimization

- Controlled system with and without compensation
- Behavior of setpoint and disturbance change
- Permanent control deviation
- Unstable control loop behavior
- Aperiodic settling of a control loop

Simulated prozesses/systems:

- Level control
- Delayed level control
- Temperature control
- Delayed temperate control
- Mixing container cascade control
- Examine Ptn controlled systems with P, I, PI and PID controller

All signal curves are saved and can be evaluated.

PID controller with PT2 system and dead time

Control quality: 72.15

Measurement liquid level

| | | | |
|---------|--------------------------------|-------|-----------|
| F_H | Set point level control | 0.000 | 100.000 % |
| F_M | Actual liquid level | 0.000 | 100.000 % |
| F_Qzu_S | Actuating signal level control | 0.000 | 100.000 % |
| F_Qab | Outflow from container | 0.000 | 100.000 % |

Measurement no. 1 (Standard measurement: 1'0.050 s)
Storage time: 1'0.050 s
Measurement start: Tu 04.05.2021 13:34:23
End: Tu 04.05.2021 13:36:23

A comprehensive manual and exercises with solutions support individualized and activity-oriented learning.