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System Models and Process Simulators

Ensuring Quality Early On – in the Planning Stage

Process simulation makes it possible to develop an optimum conceptual solution, which provides a competitive edge in terms of cost-efficiency, time and quality. This is how the planning stage is utilised to boost productivity and process reliability, put forward new visions and convert them into viable concepts.

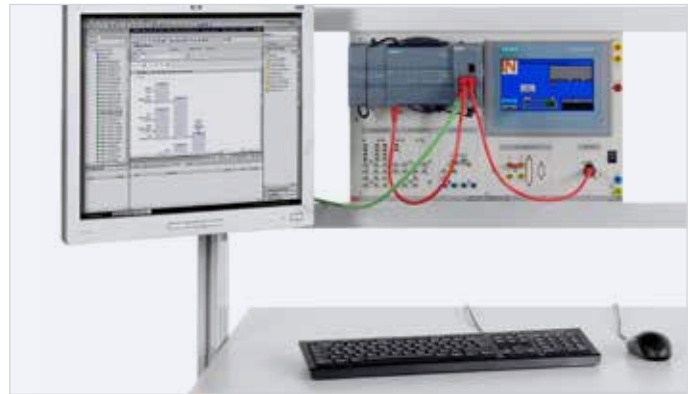
Example benefits of process simulation:

- Quality improvement
- Reduction in throughput times
- Optimisation of resource utilisation
- Acceleration of response potential
- Enhancement of flexibility
- Cost cutting
- Profit maximisation



Virtual production

Virtual imagery can practically reproduce real industrial applications. This makes it possible to simulate and analyse working procedures and processes without interrupting actual running production lines. The objective is to identify and exploit hidden potential in the production process.



Configurable production systems

The variety of different process models and simulations permits hands-on experiments and learning to be targeted towards practice-oriented training. Unlimited possibilities can be opened up by creating your own production processes.



Training systems

The following training systems are the foundation for conveying the basics as well as advanced knowledge of PLC programming:

- The UniTrain multimedia range "Automation engineering" is the ideal choice for starting initial programming exercises
- The PCB models offer cost-effective PLC system models for digital signal processing
- The system simulator provides you with the possibility of implementing any of 24 different processes in your syllabus
- The process model ProTrain features graphic depiction of complex processes
- The electrical system models are highly authentic hands-on system models



PLC Universal Process System Simulator

Set Up, Switch On and Practice

The PLC universal process system simulator has been designed especially for basic training in PLC technology. It is extremely well suited to graphic depiction and hands-on exploration of open-loop and closed-loop processes as found in industrial applications. By adding overlay masks, up to 24 different technical processes and models can be simulated. The projects are designed to precisely reflect official syllabuses.



24 overlay masks

Experiment example „PLC universal system simulator CLC 34“

Projects

- Roadworks traffic lights
- Star-delta starting
- Dahlander circuit
- Starter control
- Monitoring facility
- Container filling system
- Sluice gate control
- Transfer platform
- Buffer storage
- Filling controlled system
- Mixing plant
- Compressed air network
- Cleaning tank
- Oven door control
- Bending tool
- Automatic stamping press
- Drilling device
- Selective band dividing filter
- Pipe bending system
- Door control
- Pump control 1
- Pump control 2
- Reaction vessel
- Pill filling machine

Automatic Control Technology in Automation Engineering

One Model – Two Functions: Automatic Liquid-Level and Flow-Rate Control

Due to the fact that the controlled variable, that is to say the level of liquid, is immediately visible, this experiment is a particularly graphic one and thus eminently suitable for an introduction to automatic control technology. The compact training unit contains a liquid reservoir and a pressure transducer to determine the actual liquid level, as well as reserve tanks including a pump. Disturbance variables can be simulated using adjustable throttle valves which modify the inlet and outlet flows at the reservoir.



Experiment example "Liquid-level controlled system CLC 36"

Training contents

Automatic liquid-level control

- Assembly, calibration and optimisation of a liquid-level control loop with variable system characteristics
- Two-position controller in an intergalaction system and a controlled system with higher order delay
- Two-position controller with delayed feedback in a liquid-level control loop
- Two-position controller with float switch
- Automatic liquid-level control with disturbance variable forward feed and pre-control
- Second-order time delay controlled system with optional supplementary tank

Automatic flow-rate control

- Assembly, calibration and optimisation of a flow-rate control loop connected to a liquid level controlled system
- Principle, response and deployment of flow-rate measurement
- Investigation of closed-loop flow-rate control response to disturbance variables and set-point step changes

PLC Touch Panel Models

8 Models Introducing TIA Portal

The touch panel models are conceived in such a way that all the fundamental functions used in PLC programming are included. A self-learning course guides students through programming of data blocks, status and sequence programming and on to design of closed-loop controllers. The models are displayed in the form of an animation on the touch panel and controlled via the digital I/O of the connected PLC system. As with real models, programmers can view signals from sensors which are needed for further processing in the sequence.



Projects

- Transporter crane
- Roadworks traffic lights
- Container filling plant
- Conveyor belt
- 3-Storey lift
- Star-delta starter
- Double 7-segment display
- Room temperature control

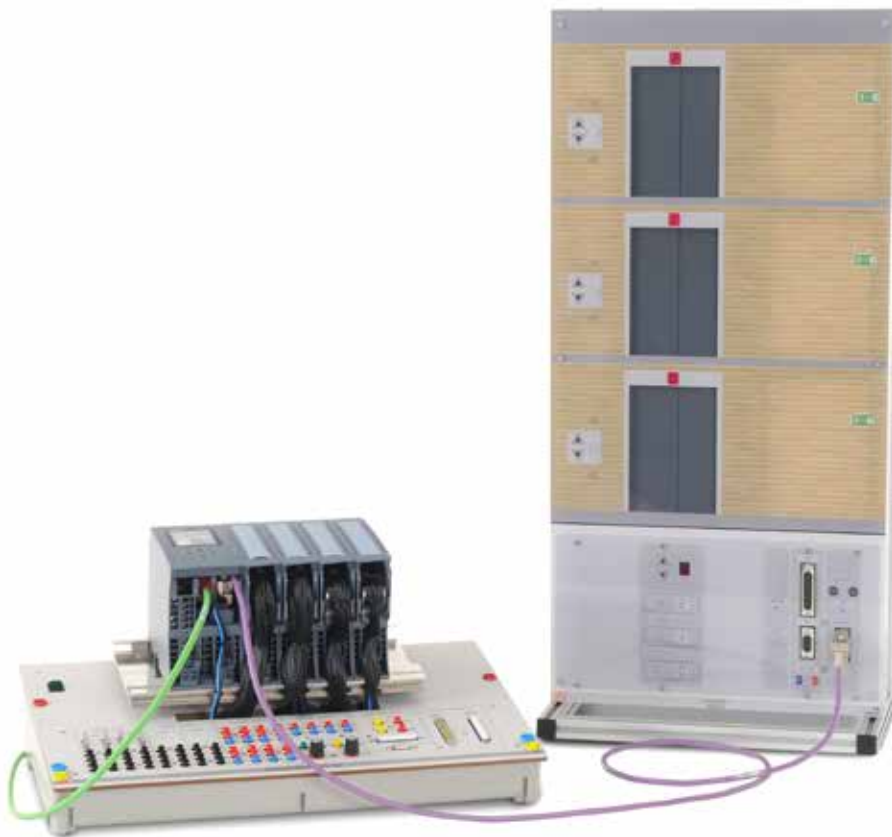
Your benefits

- Compact system (PLC, touch panel and models in one piece of apparatus)
- Programming via TIA Portal
- Programming and monitoring on screen. Alternative software solutions require separate screens
- Introduction to programming using TIA Portal standards and animated models

Electrical PLC Process System Models

Direct Connection to the Control System

With these compact training systems, subjects such as handling as well as transport and positioning processes can be explored. These constitute real life industrial conditions. Consequently they are ideally suited for learning process-oriented control programs and complex movement sequences and production processes.



Experiment example "PLC lift system model CLC 40"

Training contents

- Setting parameters, programming and operation of process controls
- Set-up and operation of hardware models, testing and fault finding
- Analysis of process sequences
- Programming in accordance with IEC 1131-1 (IL, LD, FBD)
- PLC sequence control systems
- Programming limit switches
- Manual operation, single-step and automatic operation