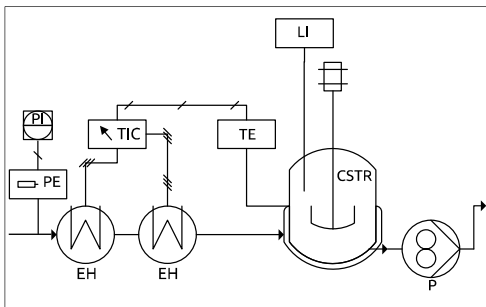


BPS

Automation system design and realization for a fluid processing island of the model factory μ Plant

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Optimization of processes is a pursued goal in large plants due to increasing targets regarding quality improvement and cost reduction. The increasing demand for product variety requires a flexible and efficient operation as well as new ideas on production techniques and automation. The Measurement and Control Department (Mess- und Regelungstechnik, MRT) is building up a large-scale model factory, which is called μ Plant, in order to provide an environment which is required to develop new concepts for plant operation and to test these in a simulated industrial framework. The model factory μ Plant consists of two processing islands, a sorting and emptying station, a stock area with buckling arm robot, several mobile robots, which transport the product in the location, and a control room for the supervision and operation of the plant. A soft drink production is simulated as use case and the operating fluid is water.



The scope of the present BPS concerns the automation of the second processing island. The second processing island (PI2) consists of three main units. Two units represent equipment where two different intermediate products are manufactured. The third unit is a mixer where the two intermediate products are blended. The feed stream is first preheated and then it is temporarily kept in the reactor tanks until the product properties meet the requirements. The finished products are stored in different tanks according to their type. They can then be pumped to

other units of the model factory.

The process control system hardware for the PI2 consists of a locally installed ABB Controller, several I/O modules and a PC with monitor. In addition, the controller will be integrated with the model factory control network with the aim of monitoring the operation from the control room. This configuration will also allow the integration of the PI2 into a use-case where different units of the model factory work together to execute a specific order.

The tasks to be performed within the BPS are:

- Familiarize with the operation concepts related to the PI2
- Record requirements for the automation of the PI2 and organize them as a prioritized list
- Configure and commission the control devices of the PI2 and program the ABB Freelance System according to the functional requirements of the PI2. In addition, a graphical user interface must be designed and implemented using ABB DigiVis software
- Tune feedback controllers for regulating level and temperature of the product in the tanks
- Plan and perform tests in order to verify the functionality of the program developed
- Technical documentation of the developed system and presentation of results

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