- Process control system
- Machine control system
- RETROFIT plant upgrading
- Glass industry
- Paper industry

Plant automation with faceplate technology

Based on the process control system Simatic PCS7, the new software packages from Schlemmer Prozess Systeme GmbH provide a universal and standardized solution for the entire plant automation. Not only melting units, lehr belts, batch plants and production lines, but also subsidiary facilities such as low-voltage distribution, compressor control, water treatment and cullet recycling, etc., are managed by the same hardware and software.

During the new construction of the tank furnace of Heinz Glas in Piesau, a new visualization system based on this technology has being installed. The tank has already been equipped with a process control system including process visualization and hardware controllers, but for economic reasons, this system was replaced with a new PCS7 process control system.

For the short term, an upgrade of the existing automation installations with new feeders and lehr belts might have offered a cheaper solution, but after a careful auditing with emphasis on properties such as consistency, future reliability, plant availability, easy maintenance, upgrading options, spare part management, staff training and service etc., it became obvious that a change to our new concept would pay off very quickly.

What is the great advantage of faceplates?

Faceplates are status windows with detailed information of controllers, motors, valves, measuring points etc. They are connected to the SPS program and can be opened from the process window by a single mouse click. Within the SPS program, each faceplate is linked with corresponding functions that manage automation actions. Depending on the degree of authorization, operators, service personnel or technologists can easily manage and monitor their respective plant components.

Faceplates offer the following features:

- All unit-related malfunctions are indicated in plain text
- Operator reports
- Each alarm can be turned on or off separately
- Alarm adjustments
- Standardization of measurement
- Graphic display and adjustments
- Operating mode selection
- Status display
- Input of parameter

As soon as the mouse is moved above a faceplate object, a help text appears and explains the respective aggregate in plain text. By mouse clicking, the standard faceplate is opened for general users. Direct access to all the parameters needed is a striking advantage of this system. Formerly, analog value adjustments had to be performed in several service windows or within the SPS program. Now, any authorized user can do this through the corresponding faceplates within the process control system. For instance, average filter values and offsets can be entered directly, alarm thresholds can be set, activated and turned off.

Four authorization levels are assigned to each faceplate:

Process operation	permits adjustment of set point and graduation
Advanced Process operation	permits adjustment of alarm limits
Controller configuration	permits adjustment of PID parameters
Alarm management	permits locking or enabling alarms

Each analog value is assigned to a faceplate and to a graphic representation (not a mere online graph), which is stored in the process record archive. This ensures a constant overall view of the plant. All faceplate-related reports are displayed on screen. Object-specific alarms can be answered directly on the faceplate. Apart from the change towards faceplate technology, several improvements have been introduced. For instance, the controller algorithm for power controlling was optimized for minimum switch frequency of the slide transformer. Now, power adjustment can be achieved by a single set command, providing an accuracy of 5 kW. This means that, for example, power alteration from 200 kW to 250 kW is achieved within minimum motor actuating time by a single `up-impulse´.

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Charger controlling

The newly designed charger offers an accuracy of about +/- 0,5 mm. Charging can be adjusted by position and duration, according to tank load.

For quick and easy compensation of bead weight fluctuations and load changes, the feeder control package developed by SPS was applied. This software package allows automatic increases and decreases in the feeder temperature profile. Each zone can be set individually, and the machine operator merely has to adjust one temperature setting for the whole feeder. In addition, appropriate bead weight determination and long-term correction allow automatic feeder adjustment.

All analog values and control circuits display their respective trends within the faceplate. Moreover, master diagrammes (e.g., one trend including all values per zone, or all temperatures per feeder) have been designed to permit quick and comprehensible analysis.
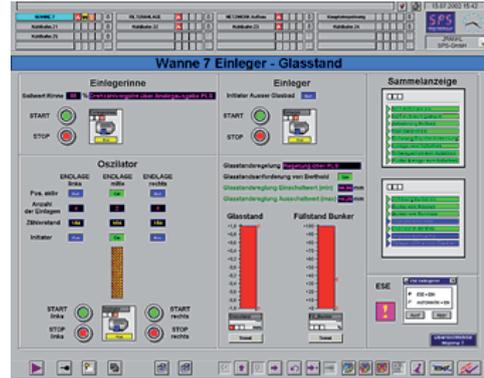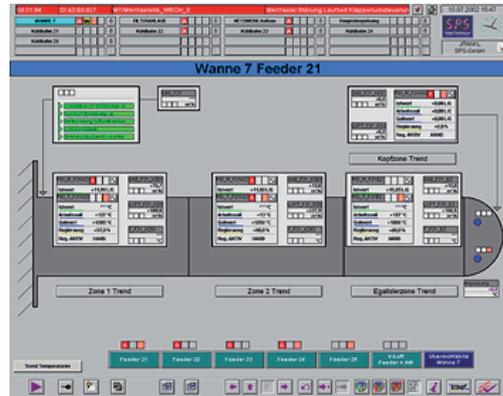
Siemens PCS7 plus faceplate software – an economical and convenient solution for automating the glass industry's particular demands

When operating a melter or several furnaces, Siemens PCS7 offers the perfect tool for

- fast reaction of the operator in case of interferences during production
- a standardized design of the whole plant
- the option to upgrade independent from a single supplier
- adjustments carried out by own personnel

A complete change to the PCS7 system may not be the cheapest solution, but in the long run, it is the most economical one. Combined with SPS software packages, the PCS7 system is a customized solution for the glass industry's particular demands, with individual settings for every single manufacturing process. The goal of SPS is to earn customer loyalty through quality and customer satisfaction. Our PLC modules no protected `black boxes´, but open-source and with extensive documentation. An example of this is the good cooperation with Heinz Glas: in recent years, SPS has equipped three tanks and several subsidiary facilities with the PCS7 system. In the future, all plants are going to be integrated into this system.