

### Decentralized Cleaning System in the Chemical and Pharmaceutical Industry

Open control concept for customised requirements.

Nowadays, whoever wants to secure a leading position on the world market as a machine manufacturer has to understand their customers, take on their requirements and often introduce the decisive ideas. This requires machine and service concepts that offer the user optimum production conditions in the long term and are attractive for daily routine requirements. Developing strategic and future-oriented concepts of this kind is only possible with vision.



Horst Groninger, the founder and owner of the company, was a visionary from the start, and his ideas consistently brought the company to the position where it is today: a competent partner worldwide for the bottling of chemical, cosmetic and pharmaceutical preparations. The outstanding feature of Groninger plants and systems is their high level of flexibility, and the company enjoys worldwide renown for its service and expertise.

Man's life expectancy has significantly increased in the last few decades. The essential factors for this are continuous research activity and the

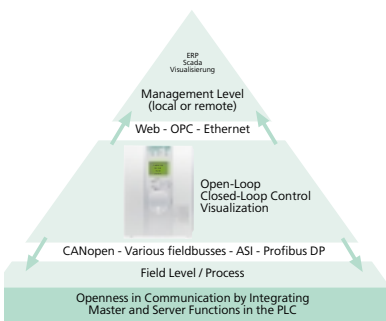
implementation of new findings from chemical and pharmaceutical research. Groninger always tackled the requirements placed on an application and user-oriented process technology in order to make newly developed substances accessible to the

consumer in suitable quality. Since its founding in 1980 Groninger has made a considerable contribution: with over 600 processing systems installed worldwide for the hygienic processing of chemical, cosmetic and pharmaceutical preparations. Groninger develops all systems and particularly industrial services as solution concepts. Close cooperation with customers and suppliers in all phases of the project and the consideration of operative conditions are characteristic features of these solutions. This was how Groninger implemented a state-of-the-art cleaning machine for syringes with a French customer. In this case, the individual requirements of the customer regarding control components had to be taken into account extensively.

#### Modules for pharmaceutical production

The ASVK fully-automatic cleaning machine enables a number of products such as glass and plastic bottles, vials and disposable syringes or those for injection and infusion containers to be prepared for subsequent further processing. Depending on their type, the products and items are intensively washed internally or externally in cleaning stations with different cleaning agents and then blown out. Each of these stations can be supplied with water or compressed air separately and operated. This ensures the economical regeneration and multiple use of

the cleaning medium. Individual cleaning programs such as washing, blowing out with sterilized air, ultrasonic cleaning or siliconizing can all be implemented with the ASVK cleaning machine. A downstream testing station checks the cleaning result. Groninger also offers in its product range associated additional equipment for cleaning machines. The complete concept is user-friendly, safe to operate and economical, thus fulfilling the demanding requirements of pharmaceutical production.



## Modular system design

The production of pharmaceutical preparations requires a number of different production systems. In order to manage the range of control components used, the French pharmaceutical manufacturer required the use of Moeller's XControl control systems. After all, the manufacturer already depended on the quality and reliability of Moeller products in their production plants and wanted to keep this system.

The control concept of the cleaning machine has a decentralised structure. Control tasks are handled by the XC600 (cycle time 0,02 ms/K) from the XControl modular PLC range. The control system itself also has a modular design. The slice design of the hardware is one of the characteristic features of the XC600, allowing it to take up to three modules based on the PC104+ card format. The XC600 also allows the Profibus-DP and

CANopen fieldbus systems to be connected on the sensor/actuator level. The CPU module represents at the same time the heart of the XC600, integrating on board an Ethernet interface (10/100 Mbit/s) and a web server. This provides openness for all technology environments, thus enabling the implementation of economical data structures that are available worldwide. This is not a new concept for the French manufacturers, who have already developed global communication structures for their existing production systems. All production systems of the individual production sites are linked via a supervisor PC. The process control level is provided by an In Touch application which uses Ethernet to access the individual XC600 PLCs of the production plants. The data exchange between Supervisor PC and XC600 is implemented using a standard OPC link. The integrated Windows NT operating system of XC600 simplifies accesses via OPC. In this way, the control level is always provided with up-to-date production data. Depending on the CPU, the application memory of the PLC can be expanded between one and eight megabytes in order to handle the different data volumes involved. The PLC was designed for industrial use and does not contain any rotating parts like fans of disk drives.

## Standardized user friendliness – an indispensable component

The specifications stipulated strongly that the already existing visualisation system had to be used for the cleaning machine. This was Moeller's XVision visualization concept, which the pharmaceutical manufacturer used as a standard system at all production sites. The open interface concept of the XC600 PLC was another important factor in this requirement. This allowed the existing MV4-570-TA1 visualization system with a 10.4" picture format to be used via the XC600's Profibus-DP interface.

MV4-570-TA1 is an infra-red touch operator panel (colour, TFT), that is also available with a stainless steel front and a 15" screen. The visualization system can be expanded for individual requirements using the wide range of slots and communication modules available. In this way the integrated PCMCIA slots reduce the otherwise time-consuming downloads required when creating and designing the screen masks for MV4-570-TA1 an essential feature. Later application expansions can be added simply by exchanging the PCMCIA card.

Design times on the PC are also saved thanks to the integrated device-related project simulation function in the "Galileo" design software. The operator panels are also suitable for global use thanks to the possibility of incorporating 100 project languages. All devices are protected to IP 65 and are therefore ideally suited for use in the aggressive environments of chemical and pharmaceutical applications. The scratch-proof operator interface is also resistant to cleaning agents and chemicals.



An integrated recipe management system for the panels also ensures the redundant production process. MV4-570-TA1 likewise manages up to 500 user passwords for up to 200 levels. Other features of this user-friendly operating concept include the history memory, alarm messages, a battery-backed real-time clock and trend display – an indispensable feature for ensuring productivity. A screen saver as well as touch deactivation are also featured in order to increase the service life of the panel. The display brightness and contrast can be adapted to suit ideally the light conditions at hand.

## Conclusion

With its open interface concept, XControl provides an outstanding base for global data management. Linked with the widely established Profibus DP and CANopen fieldbus systems, the data management also integrates the sensor / actuator level. Machine and system builders are thus able to implement economical, transparent and seamless automation solutions.

