



Sawing, Milling, Clinching, Drilling in a Single System

## De-centralised Operating Approach via Control Panel: Form Follows Function

Optimal automation is like winning in Formula One: only when all components are best defined in relation to one another can the best results be achieved. Schüco, the Bielefeld system developer and builder for window, door and facade profiles and solar systems, achieves this twice over. The corporate partner of the successful Formula One team of West McLaren Mercedes offers its profile machining system with the elegantly-shaped Beckhoff Control Panel.

Among profile machining systems, genuine "efficiency artists" enjoy a high rating these days. One example of such a systems solution for the rational fabrication of windows, doors and facade elements from aluminium and steel profiles is the "Schüco-PBS" profile machining system. It has a convincingly comprehensive overall concept with many options, optimised for Schüco profile systems. It offers customers a high price-performance ratio and provides for production reliability and production quality over the long term. The developers of the profile machining centres proudly

proclaim the concept of building the machine by teamwork "quasi" around the profile. "This gives the shortest processing times and noticeably reduces the amortisation period for our partners," say the builders of this machine. Another unusual feature: the centre is operated from the elegant and highly functional Beckhoff Control Panel. Thanks to its futuristic shape and its aluminium housing, it fits seamlessly into Schüco's Corporate Design. The fact that this satellite control station is connected with the central computer in the control cabinet by only two thin coaxial

conductors makes the installation and use of the machine in factories unusually flexible.

### Functional Control Panel Allows Simplest Operation

This machining centre, which Schüco offers its market partners as a service enhancement package, allows milling, clinching, drilling and tapping, both for aluminium and for steel, on a single system. With only one clamping, as many as five sides can be machined at once and notches on the profile ends completed from underneath. The developers

The optimal interplay of all components and optimal operation via the Beckhoff Control Panel allow the best results to be achieved with the Schüco profile-machining system



are proud of their hardware and software solution at the man-machine interface. The hardware side is represented by the advanced technology equipment set, consisting of an Industrial PC with integrated PLC and NC control, and the operator-friendly Beckhoff Control Panel, the latest state of the art.

But this solution evolved by stages: at Schüco, they remember the 1997 prototype, when the machine builder demonstrated the installation and it had to be operated from a bulky PC cart: "the first reaction to the operating panel was devastating." Too big and too massive, too unergonomic and too operator-unfriendly; in addition to that, a cable bundle as thick as one's arm running through the set provided the electrical connection to the machine. What is more, practical workers saw the pull-out drawer for the keyboard as a failure-prone solution. It soon became clear that the machine developers did not want to offer this solution to their market partners. The unequivocal credo: he who manufactures architecturally esthetic products such as windows, doors or facades can only be attracted, even in the realm of product compatibility, by an appealingly styled and functional profile machining centre. Lastly, they know at Schüco in Bielefeld "that the potential buyer also buys with his eyes."

In searching for an alternative, the development team ran into the Beckhoff firm in Verl. This specialist in advanced Industrial PC and automation solutions was at that time introducing

### This is Schüco International

The small metal fabricating firm began its success story in January 1951 with aluminium profiles for shop-windows, with a workforce of six employees: Heinz Schürmann & Co. – Schüco for short. Now more than 4100 people work for Schüco International world-wide. In 1999 it achieved a turnover of 1.95 billion DM. In addition to the 14 enterprise sites in Germany, Schüco is represented in more than 41 countries world-wide. The fundamental idea and unaltered enterprise philosophy is systems partnership. This refers to the entire process of window, door and facade construction. Materials, creativity, construction, manufacturing, installation all enter into it. Participants include internationally known architectural offices, construction companies, facade construction enterprises and handicraft shops. The cooperation partnership with the world champion Formula 1 team West McLaren Mercedes, in force since the beginning of 1999, has considerably enhanced the image, goodwill and recognition of the make.

Beckhoff Control Panels, according to protection class IP 65, are optimised for industrial use

its new Control Panel family to the market. "That was our solution" say the Schüco employees in retrospect. They found the new PC operating interface, which fits well into the scene thanks to its elegant line and its flat shape, both impressive and satisfying. What is more, the video display housing was manufactured from a single block of aluminium. "If one seeks, as a developer of Schüco machines, to transpose the Corporate Design into one's machines, then only this display is right for this machine," says the uncompromising credo.

#### Linking Satisfying Operational Advantages with the "Fun Factor"

The Schüco machine specialists found it especially elegant that only two thin coaxial conductors carried data to the machine. Thus the operating terminal, which in addition is built to the IP 65 protection class, can be almost invisibly installed up to 65 meters away from the machine, thus optimally accommodating individual space allocations. "The solution was obvious" they remember in Bielefeld, so that nothing stood in the way of a fruitful collaboration.

First, however, it was necessary to translate this approach into practice, the guiding philosophy in this connection being to guarantee the customer unitary operation for many years into the future, regardless of the location where the machine was installed. To accomplish this, the first thing to do was to separate the usually integral industrial PC computing kernel and operating and display units. The industrial PC,



#### The Control Panel Kit – Variations in Form and Function

With the CP7000 Control Panel family, Beckhoff introduces an extremely flat PC operating interface to industrial design. Operating and display elements form a standalone unit, separate from the control level. Beckhoff Control Panels, according to protection class IP 65, can be installed as much as 65 meters away from the computer unit:

- Connection to the PC is by two coaxial conductors with Beckhoff CP-Link
- A single PC can be used to operate up to 3 Control Panels
- CP-Link sends the signal for the image, the keyboard, 2 serial ports, the floppy drive, auxiliary buttons and indicator lights as well as the power supply
- Housing and front keyboard built individually for optimal fit to machine requirements
- Integration of electromechanical buttons, switches, scanner, handwheel and other components in the Control Panel
- Features and options: aluminium housing, splash-proof according to IP 65, PC keyboard in various versions, special PLC keys with LEDs, 10, 12 or 15 inch TFT display, Touch Screen or Touch Pad

The new C3300 series Industrial PC matches the "look & feel" of the Control Panel family. Here, behind the attractive face, there is a PC controller of the highest performance class. The 19 inch built-in series C3300 Industrial PC, equipped with an Intel Celeron or Intel Pentium III processor on a standard ATX motherboard, is available with 12 or 15 inch TFT display.

Functionality and esthetic design in aluminium:  
The Control Panel housing is milled from a block of aluminium and thus possesses low weight, high strength and enormous resistance to environmental hazards

equipped with a Beckhoff CP-Link interface card, which allows the Control Panel to be connected with any chosen PC, moves to the control cabinet. With CP-Link technology, connection of a single PC to as many as three Control Panels is possible. In the Schüco profile machining system, the Panel is mounted on a swinging support arm system to give the machine operator the best overall view of the manufacturing process. The mounting location is often determined only after installation of the machine. Separating controller from the operating interface ensures that the "look & feel" of the machine remains the same, regardless of future developments in the world of automation. This it is unimportant whether in the future functional considerations drive the adoption of considerably more powerful computers, or more compact industrial PCs come into use to save space. The solution is rounded out by the exclusive Schüco-style screen form, under which runs the Schüco-CAM machine control software for automated standard manufacturing.

As the Schüco team proudly describes the approach "the data compatibility problem is thus definitively solved by formats defined for the calculation and design software SCHÜCAL/SCHÜCAD for profile elements, and for the Schüco-CAM machine software." This allows simple workflow from drawing to machining and is, for operators, the most important key to highly efficient production.



### Beckhoff CP-Link Technology

CP-Link connects the Control Panel with the PC at a distance of up to 65 meters via two coaxial cables and thus offers the greatest flexibility for placement of the Control Panels at the machine or equipment. The connection from the Control Panel to the PC itself is made via CP Link, a transmission technology having a data rate in the gigabit range. No additional power supply is needed. The CP-Link Interface is implemented as an ISA bus insert card and is thus usable in any PC. The PC is also equipped with a graphics card providing an LCD interface. The PC ports for LC display, keyboard, COM ports and floppy drive are converted by the CP-Link insert card into a high-frequency serial signal and transmitted via coaxial cable to the Control Panel. The CP-Link Interface in the Control Panel reconverts the serial signal for the original PC ports, to which the components of the Control Panel, such as keyboard, TFT display, touch screen, touch pad and floppy drive are connected, but at a 65 meters longer distance than would ordinarily be possible. Up to three Control Panels can be connected to one PC. For each Control Panel, one CP-Link insert card is installed in the PC. All displays show the same image. Data can be entered on the PC keyboard, on the keyboard of one of the Control Panels or on a standard keypad connected to one of the control panels or directly to the PC.