SieMatic uses robust Embedded PCs from Beckhoff in its kitchens

Industrial PC technology in high-end kitchens

The premium kitchen manufacturer SieMatic is used to being a trendsetter. The concept of the SieMatic S1, which was introduced for the first time at the beginning of 2008, is based on the realization that ongoing changes in consumer habits are redefining the modern kitchen. Today, areas of life such as cooking and eating are no longer separated from our needs for entertainment, relaxation and communication. Thus, the kitchen becomes the central living room; a place where family or friends gather to cook, eat, celebrate, work, play or simply to "chill out."

The kitchen is redefined as a living room with the SieMatic S1.

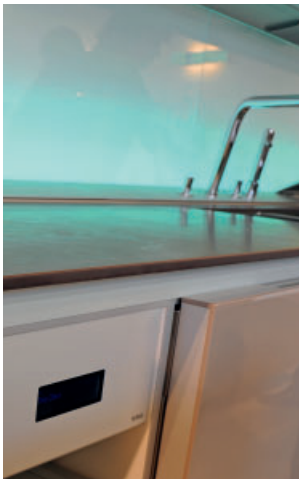
Technically advanced, aesthetically restrained

The redefined "living room" – the kitchen – must meet these requirements, i.e. activities that up to now have been spread across different rooms, such as watching television, working, learning or celebrating – and, of course, cooking and eating. These activities are increasingly concentrated in one place. SieMatic caters to this changed concept of the kitchen with the S1. The SieMatic S1 has won several awards, including the red dot award "best of the best" in 2008 as well as four additional red dot awards for product design in 2008. The SieMatic S1 stands out from conventional kitchens by its minimalistic style, integrated design and by its technical details: the control system for the drawer sliders, for example, allows up to three drawers to be opened electrically at the same time. A clever lighting controller, which distinguishes between work lighting, detail and mood lighting, provides lighting to suit the different uses for the room.

With the "SieMatic Grid," SieMatic has developed a control concept for multimedia packages on the basis of T+A audio and video components and a Beckhoff PC. The SieMatic Grid places multimedia and kitchen-specific content at the user's disposal on a uniform screen. This ensures that when in the kitchen, families won't have to do without the comforts of modern entertainment, such as MP3, radio, DVD and video, Internet, e-mail, newsfeed and digital slide shows of favorite photos. Of course, recipes can also be called up on the system. Menu navigation on the display takes place clearly via wireless keyboard or airmouse.

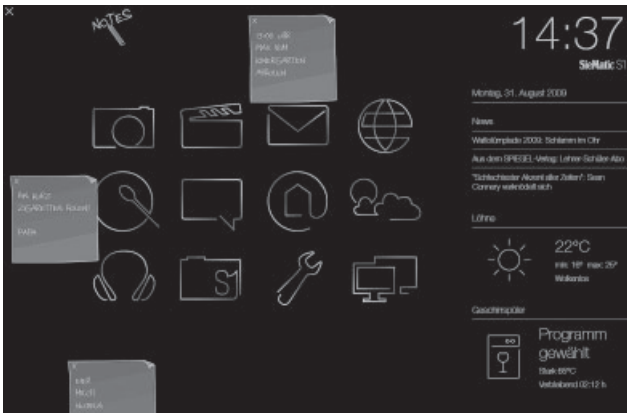
Modern life is multimedia-based

Modern life in the kitchen also means a multimedia-based life. In T+A, a high-end audio/video manufacturer from Herford, Germany, SieMatic found a project partner for the implementation of the multimedia requirements, while retaining the minimalistic design. With Beckhoff, SieMatic developed a platform for the central control and operating software on the basis of a CX1020 Embedded PC. "This is where our IT department came into the game," explains Thorsten Pawelczyk, who is in charge of information technology at SieMatic: "With Beckhoff we have found an expert partner who can meet our requirements. Previously, I had only known the Beckhoff products from our production, as controllers for our kitchen manufacturing line, e.g. in the woodworking machines by IMA, Homag or Priess&Horstmann. However, the Embedded PCs are also ideally suited for use directly in the kitchen. An important aspect for our decision was the customization of the operating system image for the Embedded PCs."



A clever lighting controller, which distinguishes between work lighting, detail and mood lighting, provides lighting to suit the respective use of the moment in the room.

The SieMatic Grid makes multimedia and kitchen-specific contents available to the user on a uniform screen. Menu navigation on the display takes place clearly via wireless keyboard or airmouse.



The SieMatic Grid includes an integrated Internet browser with e-mail functionality, a media player, photo slide shows for the user's own digital photos, a news reader and a detailed weather forecast. All modules are configurable and can be adjusted individually by the user.

Functions of the SieMatic software

SieMatic's self-developed software for the selection menu and the control functions forms the heart of the SieMatic Grid. The basis is a modularly structured Beckhoff Embedded PC equipped with a Windows XP Embedded operating system as well as a .Net framework. Via RS232, the Beckhoff PC controls the T+A components as well as managing all functions that they do not take care of. Above all, these naturally include all the typical PC tasks, such as Internet access, e-mail access and data services (such as weather forecast or newsfeeds), but also entertainment programs, such as slide shows. All Miele@home appliances are also integrated via the Ethernet interface of the Embedded system.

The most important functions, however, run invisibly in the background, because the Beckhoff PC works almost like a mediator between different worlds: for example, a television broadcast can be interrupted for messages from the Miele system – that the dishwasher program has finished, for instance – if the user so desires. The integration of other systems – for example, the picture from an IP monitoring camera – is easy to accomplish using Beckhoff hardware. It was clear from the outset to SieMatic project manager Thorsten Pawelczyk that the SieMatic Grid would be a constantly growing and changing system: "The fact that the Beckhoff automation system hardly sets any limits regarding the integration of other systems comes just at the right time."

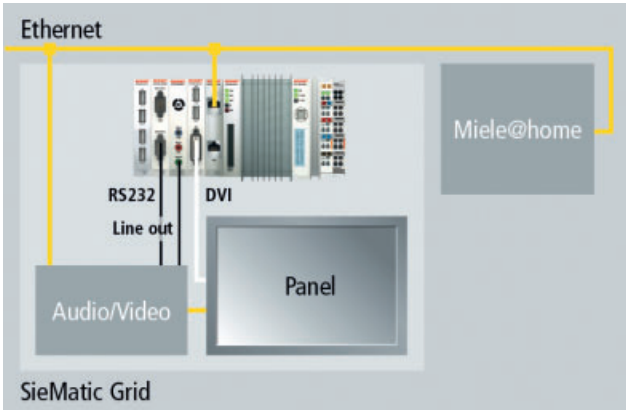
Made-to-order operating system image

The Beckhoff CX1020 Embedded PC, currently equipped with an Intel® Celeron® processor, is mounted on a DIN rail in one of the kitchen floor cabinets. The CX1020 CPU has modular, expandable interfaces for DVI/USB, audio, RS232 and a 4-way USB hub. "It was particularly important to us to have an operating system image adapted to our needs," explains Thorsten Pawelczyk. "In the current configuration we use a made-to-order Windows XP Embedded operating system with the .NET Framework 3.5, among other things." The close contacts between Beckhoff and Microsoft also benefited SieMatic. As a Microsoft Windows Embedded Gold Partner, Beckhoff gains early and more intensive access to the latest Microsoft technologies. This way, SieMatic was able to use a beta version

Thorsten Pawelczyk, Information Technology Manager at SieMatic

Simple step towards home automation

The Embedded PC is simple to extend by adding Bus Terminals, for example in order to process building automation data points. The Embedded PC can alternatively be integrated in the higher level building control via the Ethernet network. A wide range of different Bus Terminals permits the integration of all sensors and actuators for lighting control, energy consumption metering and garden irrigation, for example, as a function of data from a weather station. In addition to the gains in comfort and convenient operation, the significance of intelligent home automation is continually increasing due to the demands for energy optimization and increased security needs.



The CX1020 Embedded PC, the control center of the multimedia package, is mounted on a DIN rail in one of the kitchen floor cabinets.

of Windows Embedded Standard 7 around six months before its market introduction. The new Microsoft operating system contains, among other things, a framework for a multi touch panel, which will also be used in SieMatic kitchens in the near future.

The CX1020 Embedded PC makes do without rotating parts, dispensing with fans for cooling and hard disks for storage media. That was one of IT Manager Thorsten Pawelczyk's main requirements. The flash memory card used instead has further advantages for SieMatic: if, for example, updates are available that exceed the capabilities of a normal online update, then the flash card can simply be exchanged. New and improved functions are then available to the customer right away. This strategy additionally has the advantage that the exchange of a flash card is much simpler for a kitchen manufacturer to do than loading a new operating system or even exchanging a hard drive.

Design is a core competence

The expert design of kitchens is obviously one of SieMatic's core competences. The operating interface does not represent an exception here, because it integrates itself seamlessly into the overall kitchen design. "Seamlessly" should be taken literally here, because the display disappears completely behind an otherwise black glass panel and is indiscernible when it is switched off. SieMatic offers two display variants: a 19-inch panel, which is connected to the Embedded PC via DVI, or a 32-inch screen with a VGA connection.

The project was implemented on the basis of Microsoft .Net technology and was already awarded the 2009 Innovation Prize for WPF-based (Windows Presentation Foundation) software by Microsoft in the first year of completion.

International and future-proof

As a globally-positioned company, SieMatic delivers its kitchens all over the world, which means that they have to work without failures and – as described – without fans under the completely different climatic conditions in Seattle, Frankfurt, Shanghai or Bahrain. The appropriate character/language sets for operation must also be available all over the world, according to the customer's wishes. The wealth of PC technology experience in harsh industrial environments that Beckhoff has amassed worldwide over almost 30 years also benefits the kitchen manufacturers. Thus, SieMatic's IT Manager Thorsten Pawelczyk is already looking forward to the next generation of CPUs based on Intel® Atom™ technology, which will provide even greater performance but with the same size.

SieMatic S1 kitchen www.siematic.de/S1
Embedded PC www.beckhoff.com/Embedded-PC