



Customer-specific Control Panels offer outstanding added value

Three development levels for customized operator interface panels

As “the face” of a machine, the operator interface is one of the most important areas where machine builders can differentiate from their competitors. With this in mind, customer-specified panel designs from Beckhoff are available based on the company’s extensive range of standard Control Panels and a wide selection of accessories. The broad product range offers outstanding scalability in any case, but it can also be modified extensively, for example, by adding electromechanical function keys, and tailoring them to any machine operation need. In particular, the user benefits from three optional development levels for customized Control Panels, all of them offering the high quality standards set by Beckhoff as well as minimized development costs and effort.

How much users appreciate the added value of individualized control panels is shown by the fact alone that they make up between 45 and 50 % of all Control Panels that Beckhoff delivers. Although standard devices as a rule are less expensive than custom-made products, with Beckhoff it is not true that there are always immense additional costs and long development times involved. Thanks to the diversity of standard devices and extensive manufacturing know-how, the development costs remain comparatively low – and the same applies to delivery times: simple requests, where, for example, only the front laminate is to be changed, can usually be completed in a maximum of seven working days. Even more elaborate projects, involving a modified housing design, require little time, with eight to ten weeks from customer inquiry to delivery.

Three levels – from customer logos to special housing designs

The first development level of a customer-specific panel application merely involves visual modifications. This starts with a slide-in logo which the customer can either insert directly on-site in the insertion slit in the front laminate or have it inserted by Beckhoff as a service with a small surcharge. This category also includes adapted laminate designs – i.e. a completely customer-specific printed panel – according to the user’s specifications or supported by an industrial designer if necessary. Thanks to close co-operation with Beckhoff experts, this is a successful way to create an application-specific operator interface panel very quickly.

The second level of customer-specific development uses the extensive Beckhoff kit of panel components. This means that the needs-based integration of various buttons, switches and circuit boards can be implemented in an existing standard housing with unchanged dimensions. There are, for example, circuit boards in different shapes for building individual buttons, which are always used in several customer-specific devices to minimize engineering costs. These short-stroke or ring-illuminated buttons are designed and developed by Beckhoff. Since all inputs and outputs are available as digital I/Os, they can be connected to the outside very flexibly using bus communication. Frequently, the high-performance EtherCAT fieldbus is used, but connection to other networks such as PROFIBUS, PROFINET and CANopen is also possible. The second development level is still characterized by an extremely modular design – and a robust, integrated device at that – without requiring error-prone electrical and mechanical interfaces. The alternative would be to extend operator interface panels by means of plug-in button modules on the left or right; this did not prove successful in practice according to any of Beckhoff’s market findings. The main reasons for this are the additional interfaces mentioned and the lack of a requirement for extension modules, since the user is in any case already precisely aware of the desired operating elements from the outset.

The third and most elaborate development level encompasses a new housing construction, in order to implement the customer’s own design or special



The new multi-touch panels can also be customized, for example, using electromechanical function keys and with standard push-button extensions.

ergonomic adaptations, for example. Virtually no limits are imposed on the housing design, the color or the choice of materials. Looking at the resulting panels, the standard devices on which they are based are usually no longer recognizable so the "Beckhoff panel" is quite literally transformed into "the customer's panel." In addition to Beckhoff's many years of experience, the know-how of industrial designers often contributes to highly customized designs. They can either be experts from Beckhoff or the customer's own designers who implement the end user's requirements and subsequently work hand-in-hand with the Beckhoff specialists on the solution.

Over 20 years of know-how and commitment to quality

Beckhoff brought the company's first operator interface devices onto the market more than 20 years ago. Even these early Control Panels were milled from a solid aluminium block which at the time was a completely new approach, but then and now it offers now many advantages. For example, the housings can be designed extremely flexibly without having to fundamentally change the shape. In addition, the aluminum housing is very sturdy and has outstanding capacity for heat dissipation so that the electronics are efficiently cooled. The need for sustainability is also a strong argument for such an easily recycled raw material.

Another advantage of the customer-specific display solutions is the high quality standards of the entire Control Panel product family, because the individual devices are not produced apart from the standard line, but are integrated into the manufacturing process of the standard products. Accordingly, the same stringent requirements for testing under the same laboratory conditions apply to all product groups, whether standard or customer-specific. This also holds for

new components to be installed according to customer specifications: they are tested extensively with regard to EMC, thermal resilience, shock and vibration, validating their suitability. An additional quality characteristic is the extensive hardware know-how which in the case of the Industrial PC products even extends to in-house development, design and assembly of the main boards.

Endless application possibilities

The wealth of experience in Beckhoff's team of experts is as extensive as the customer requirements are different. At the end of the day it is precisely in this variety that the advantage of a customer-specific control solutions lies. For instance, a "built-in," cabinet-mounted Control Panel with a width of 1.20 m was designed for a machine manufacturer – without doubt a technical challenge, but still a request that could be successfully answered. After all, the housings could even be milled out of aluminum blocks up to 4 m in length if necessary. A further good example is the retrofitting of an RFID reader: the user can open the device or a corresponding bay directly on site and flexibly and simply retrofit modules like the RFID reader – which is usually very expensive – if this is necessary in the application. Aggressive environmental conditions also frequently represent big challenges. Therefore, operator interfaces, for example, had to be designed with extreme robustness in order to work reliably even in aggressive environmental conditions.

With an eye for detail, customers can opt for special surfaces on stainless steel operator interface devices. In this case Beckhoff performs a special mechanical surface treatment, carrying out not the usual standard lengthwise grinding, but a specific "cloudy" grinding in order to adapt to the finish of the end customer's



Based on the broad range of standard Control Panels from Beckhoff, company know-how and the variety of customization options, an ideal solution is available for virtually any application.

control cabinet and machine bed. Furthermore, Beckhoff developed a complete, stand-alone stainless steel device in a “hygienic design” for a food packaging machine that seals the ends of sausages with metal rings. Based on examples like these and many other customer requirements, two complete standard stainless steel panel series were created – the CP77xx Panel PCs and CP79xx Control Panels. These panels for demanding environments conform to the strict hygiene regulations in the food/beverage and packaging industries as well as in medical technology and in cleanrooms.

Multi-touch panels go beyond simple software adaptations

The new CP2xxx and CP3xxx multi-touch panel series offer an increased range of possible applications and enhance operating convenience. This technology also has implications for customer-specific solutions. On the one hand, technical progress is reflected in the display or touch requirements, while on the other the new devices also have to be adapted to various machine applications. Therefore, some key customer accounts have already switched from the previously used resistive touch technology to the more robust Projective Capacitive Touchscreen (PCT) technology used in multi-touch devices. Their high touch-point density permits exact and reliable operation with short reaction times and, thanks to Beckhoff’s own touch controller and the individually programmable touchscreen sensitivity, operation is allowed while users wear thin work gloves (e.g. made of latex) if necessary.

Despite the many possibilities of the multi-touch operation, the devices can be adapted in many areas beyond the visualization software. Many panels are equipped with PCT and a supplementary customer-specific push-button exten-

sion. Even though a membrane keyboard around the edge of the display is rarely requested today, experience shows that customer-specific printing of the PCT glass pane and additional electromechanical buttons continue to be necessary. Such push-button extensions, e.g. underneath or to the side of the display, prove to be particularly important if they enable the previously used resistive touch panel of an existing machine to be replaced simply and without great effort using a modern multi-touch device.

Author: Klaus Niewöhner, Product Manager, Industrial PCs, Beckhoff



Further Information:

www.beckhoff.com/ControlPanel