Standard vs. Proprietary

Switching from a proprietary embedded solution to a control solution based on standard components pays off even in a price-sensitive market. Blech-Tec demonstrated that with the second generation of its compact bending machine for intricate sheet metal workpieces. With its new controller – selected from B&R's extensive portfolio of industrial-grade solutions – Blech-Tec benefits from considerably increased flexibility, is able to integrate new functions with considerably lower development costs and enjoys the support of a controls partner with a strong global presence.

Renowned panel builder Berker and other users of the BT-150 are able to produce prototypes and small batches of bent components faster and cheaper.

Photo: Berker GmbH & Co. KG

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"Adding functionality to an embedded solution is extremely expensive, if it's even possible at all," notes Ralf Beger, Blech-Tec's founder and managing director. He learned this lesson the hard way, having selected a proprietary controller for the first generation of the BT-150 small parts bending machine back in 2005. At the time, the hardware costs for this solution were lower than for a standard PC-based controller. Typical of embedded solutions, however, the fixed functionality quickly began impeding further development of the machine and generating unforeseen costs – making it difficult for Blech-Tech to enter new markets or even strengthen its position in existing ones.

Proprietary has lost its cost advantage
Much has changed since then. It is now possible to find standard components that combine low hardware costs with a high degree of flexibility. Leading the way is B&R with its fully scalable portfolio of modular, interoperable industrial control products.

Both the hardware and software elements of the control solution can be trimmed to fit the task at hand with no dead weight, and expanded effortlessly when the time is right.

The BT-150 is designed to form intricate workpieces out of sheet metal. A Power Panel C70 from B&R with a customized design provides control and HMI functionality. (Photo: Blech-Tec)

Since the eight stepper motors in the BT-150 are controlled by four 2-axis ACOPOSmicro modules, there is no longer a need for homing after a disruption or product changeover. (Photo: Franz Rossmann)

That's why, in 2015, Blech-Tec turned to automation specialist B&R for the second generation of its controllers. According to Beger, the decision was influenced by more than just technical criteria. "B&R had been recommended to us emphatically by numerous friends in the industry, who praised their dependable hardware, reliable delivery and outstanding support. That's what ultimately tipped the scales for us."

Maintenance-free controller with custom design

Developed in close cooperation with B&R's experts, the BT-150's new controller was ready for action in no time. It is based on a C70-series Power Panel with a 10.1" analog resistive touch screen in portrait format. Like all devices in this series, it is equipped with an Intel Atom CPU, 256 MB DDRAM, 16 KB FRAM and a 2 GB onboard flash drive. With no hard drives, fans or batteries, C70-series devices are entirely maintenance free. The front side, featuring Blech-Tec's custom overlay design, offers IP65 protection.

Four 2-axis ACOPOSmicro modules are used to control the machine's eight stepper motors. The drive modules communicate with the controller via X2X. "The new controller is a much simpler construction than our embedded solution," Beger is pleased to report.

Even so, they have been able to integrate decisive new features, which had previously not been possible due to the lack of flexibility and high development costs associated with the embedded solution. Some of the new features include remote maintenance and data transfer via Ethernet and USB. The ability to interact directly via the touch screen rather than with hardware keys makes the machine noticeably easier to use. "Entering text is something that has improved considerably," says Beger. "Not to mention that we've made controlling the bending process itself more convenient."

Language support for more effective internationalization

Blech-Tec uses the graphics capabilities of the Power Panel C70 to guide the user through the bending process. The various bending stations are displayed, showing the user how the tools are installed and which tool should be used for the next bend. Other new features include monitoring functions, such as an operating time counter and an alarm history.

The greatly expanded language support made possible with the new B&R solution is a decisive advantage for the BT-150 on the global market. "We used to have a limited number of languages, which directly affected the regions we were able to make sales in," explains Beger. Luckily, that is no longer an issue. Blech-Tec has even begun implementing Japanese and Chinese versions of its user interface.

B&R smooths market entry

The fact that Beger is now getting his control components from a well-known supplier helps clear the initial hurdles when entering new markets. "Our users are happy to see an internationally renowned company handling our control components, because it means they can expect ongoing innovations and a reliable supply of replacement parts anywhere in the world."

Blech-Tec also contributed its fair share to the international success of the BT-150. After all, it allows users to form light-gauge sheet metal without any specialty tools.

For prototyping and short-run production, manual lever presses are still the tool of choice. Typically, a separate tool insert is produced for each bend, which is rendered useless as soon as you modify the workpiece or changeover to a new product. Unable to accommodate even minor adjustments, this can be a costly and time-consuming way to produce small batches and substantially altered prototypes. The footprint of the required machinery should also not be underestimated. After all, a separate manual lever press is frequently used for each bend so that each workpiece can be fully formed without having to swap out tools.

Progressive stamping tools, on the other hand, are only economical at higher produc-

Ralf Beger
Founder and CEO, Blech-Tec GmbH

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tion volumes due to their high price. These tools are also extremely inflexible, and can only be used effectively once it is absolutely certain that there will be no further modifications to the shape of the product.

Prototypes and small batches without high tooling costs

With the BT-150, parts can be produced using standardized toolkits, eliminating the preliminary step of making custom tools. Changes in length and angle can be fine-tuned, and even changes to the gauge of metal being processed can be accommodated without switching tools. The BT-150 allows most bends to be performed sequentially with no changeover. It also ensures an extremely high level of repeat precision. Once a program has been created, it can be reused quickly, easily and reliably.

Berker is one of a growing number of internationally renowned companies that use the Blech-Tec machine in their R&D departments. Manufacturers of power switches used to have to die-bend their prototypes in quantities of 1 to 250 out of stainless steel and nonferrous metal in thicknesses of 0.2 to 2 millimeters on a knuckle-joint or screw press.

Today, around 75% of all bent components can be created with a BT-150, and the costly and time-consuming use of auxiliary tooling is largely obsolete. That is also what has made it an indispensable member of Berker's R&D tea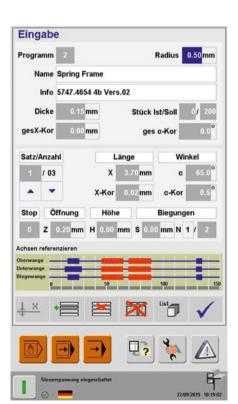m. Judging by the large amount of interest that has already been expressed in the machine with the new controller, there will soon be many more companies who can no longer imagine life without the BT-150. ←

With its new controller, the BT-150 is now able to show the user which station should be used to make the next bend. (Photo: Krinner engineering office)

The touch screen on the Power Panel C70 helped Blech-Tec simplify operation and greatly expand the range of supported languages. (Photo: Franz Rossmann)