

A digitalization pioneer

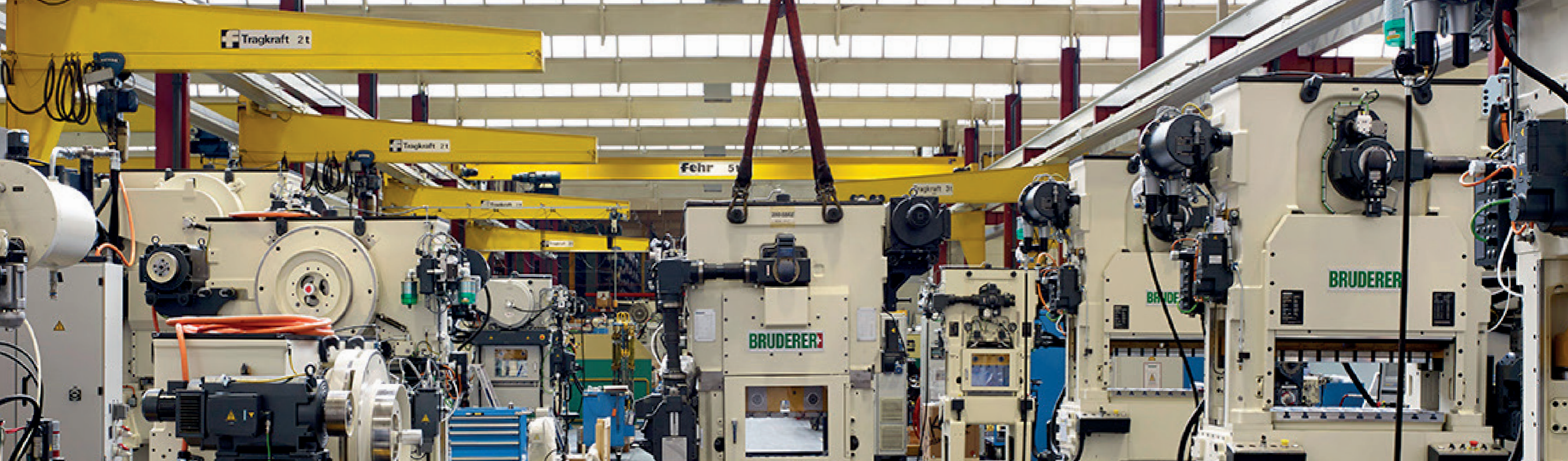
BRUDERER networks its production machinery with a tool management solution

In the sheet metal stamping and forming industry, BRUDERER stamping presses are synonymous with maximum performance, utmost precision and unsurpassed reliability. To ensure that it can continue to manufacture these in such a high-wage country as Switzerland, BRUDERER has spent

years digitalizing its manufacturing processes. By connecting its production machinery to the TDM tool management solution from TDM Systems, the family company has once again broken new ground – and successfully so, according to initial analyses.

BRUDERER is a family company with a global reputation as an innovator in cutting-edge technology, employing around 460 people worldwide, 370 of them in Frasnacht, Switzerland. It is here that the medium-sized company has been developing and producing its stamping machines – an industry favorite worldwide – for over 75 years. Like all companies in well-developed industrial countries, BRUDERER faces the

challenge of keeping its manufacturing costs competitive in the face of high labor costs. In addition, the family-run company wants to offer attractive employment. This point is something that Roger Müller, production manager at BRUDERER, considers "increasingly important", in view of the growing shortage of skilled workers.



A visionary pioneer

Using TDM made production transparent

To bring transparency to tool management and free CAM programmers from time-consuming research, BRUDERER decided to introduce digital tool management from TDM Systems exactly 30 years ago. Michael Fankhauser, the system administrator whose responsibilities include the introduction of TDM, has been with the company since 1983 and still remembers how things were before the software was introduced. At that time, the foremen had to order the tools their departments needed. However, these were not always selected according to technical requirements, but based on personal preference. In other words: Organized chaos. Since there was also a lack of transparency, the CAM programmers had the time-consuming task of requesting all the tool information needed to create their programs from the procurers. As part of a CAM project in 1991, BRUDERER was one of the first customers in Switzerland to introduce digital tool management from TDM Systems.

Digitalization reduced procurement costs by 30%
BRUDERER spent the equivalent of two man-years recording around 5000 items. This was a huge effort, but one which Fankhauser believes quickly paid off. In a short space of time, procurement costs for resources decreased by around 30 percent thanks to the transparency gained. The tools could now be displayed graphically in the tool presetting. As a result, fewer errors occurred in tool assembly following the launch. Most importantly, it was a win for the CAM programmers. They were able to view the current tool stock in TDM and it now took them less time to create the programs.



Without TDM, no tools can be used on integrated machines, and no orders can be processed.

Michael Fankhauser,
system administrator and TDM administrator at BRUDERER



TDM software in production

TDM is the most important software used in production, aside from ERP

For a good 20 years, BRUDERER used the TDM solution to manage their tools. However, with the expansion of the tool management solution ten years ago, the Swiss company also wanted to exploit the potential of the tool data more extensively. According to Fankhauser, with the upgrade to TDM V4 in 2011 a "new dynamic came into play". BRUDERER gradually introduced new modules and interfaces. This decision made TDM the most important software used today by the Swiss firm for its production, after the ERP system. "Without TDM, no tools can be used on integrated machines, and no orders can be processed," explains Fankhauser.

The advantages of central data maintenance

Even though data maintenance requires constant effort, "the pros definitely outweigh the cons," confirms Roger Müller. This is because, with TDM, the data no longer has to be maintained in different systems. All data now sits in one database. Or, as Fankhauser puts it, "in one pot of data, from which all systems draw via their interfaces". But it is not just the central data storage that provides a clear advantage in terms of process reliability. Since the data, which is recorded in different places on different systems, is also transferred to and from the TDM database via different interfaces using an automated process, transmission errors have practically been eradicated. Added to this is the fact that automated data transfers also save employees time. Since BRUDERER has been using the TDM Presetting Module, for example, the tool setters have hardly had to enter any data manually. Target data and actual data are exchanged automatically. "This greatly simplifies the work required," says Müller.

Future machine integration project

Introduction of a continuous data transfer process with the help of TDM

TDM project team at BRUDERER: Sandro Della Polla, CAM programmer, Michael Fankhauser, system administrator and Roger Müller, production manager. Scanning the data matrix codes triggers the automatic data transfer to the machine control.



Thanks to many years of experience with TDM, we hoped to benefit from significant optimization of the potential offered by machine integration, which is why we have decided to work with TDM Systems on the project.

Michael Fankhauser,
system administrator and TDM administrator at BRUDERER

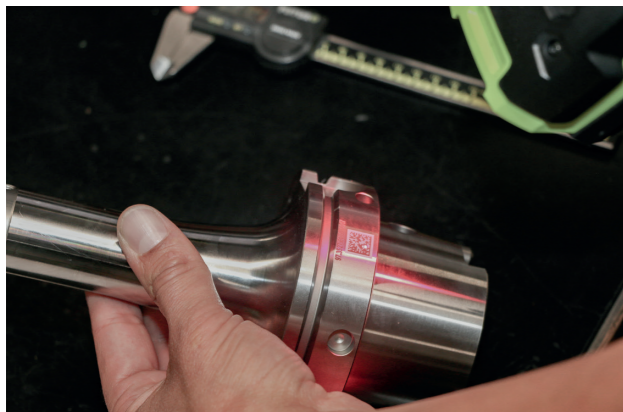


Secure processes and automated data transmission

"We want the most secure processes possible, and that also always means avoiding manual transmission," explains Fankhauser. The dedicated BRUDERER team was set a challenging but achievable goal. A consistent data connection from TDM to the machines had to be created. This may sound simple but, in practice, the project took clever planning and a corresponding amount of effort. This certainly was the case when it came to integrating the production machine control system. At present, there is no general solution. Not to mention the fact that only a few machine manufacturers or machine control developers allow bidirectional data transfer via an internal interface. The development of an interface for the machine control system in order to transmit comprehensive tool data was therefore a challenge. As Fankhauser points out, it depends on a wide range of factors, such as the type of machine or the control software used.

Realizing the potential for optimization

Based on the positive experiences they had already had with the TDM software, BRUDERER expected there to be significant potential for optimization from machine integration, and opted for the project. Just as in 1991, they were pioneers once more – and not just in their industry. The developers needed a whole year to be able to transfer the various tool data from TDM to the machine control systems used at BRUDERER. To complete this task, TDM Systems brought in a development partner, the company ECI. The so-called "ECI Box" is a type of middleware, which takes over the data exchange between TDM and the machine control system.



Scanning the data matrix codes triggers the automatic data transfer to the machine control.

Actual service life durations for planning

The central database has allowed for process reliability based on actual data

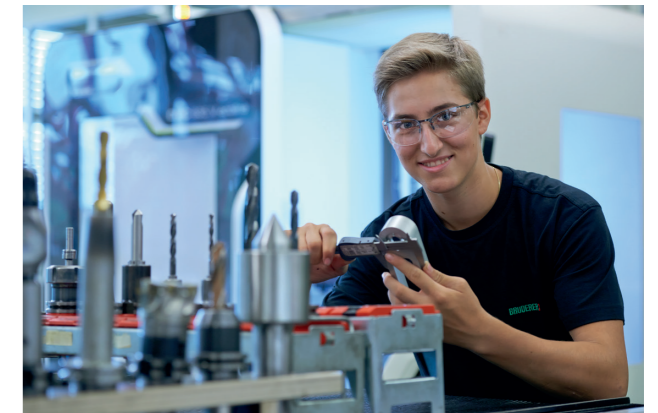
Bidirectional data communication with the machine

As Fankhauser explains, the machine integration that was implemented is an extension or expansion step of the TDM Shopfloor Manager module. This allows the real machine stocks and tool conditions to be taken into account in parallel with the planning of tool requirements and the provision of the necessary tools. An example: The ECI interface is used to transfer the actual service lives of the tools used to the TDM database. This is a key factor for process reliability. Previously, the machine operators, the CAM programmers and the tool setters worked with values based on past experience. However, according to Sandro Della Polla, CAM programmer at BRUDERER, these values ended up being more or less well-founded assumptions. These initial plans or assumptions are now constantly being verified with actual data from the machine. That is why – as BRUDERER's initial evaluation would suggest – the tools are now longer in use than before.

Reduced setup effort thanks to service life monitoring

Another advantage: A so-called traffic light system signals to the machine operator when the service life of the tools being used to machine the order falls within a critical range. As a result, they can now plan ahead and ensure that the tool they need will be available when the tool comes to the end of its life. In addition, initial analyses suggest that the required setup effort has also been reduced. Since the tool setters can now use TDM to see which tools are already on the machine, they only need to assemble the tools on the tool list that are also required to machine the order. All these points help BRUDERER to process customer orders even faster.

Production using the stamping machines requires a variety of tools, which are managed transparently with TDM.



BRUDERER stamping machines are synonymous with maximum performance, utmost precision and unsurpassed reliability.



Fewer faults and machine downtimes

High process reliability thanks to automated data transfer

As planned, thanks to the interface, tool data no longer has to be entered into the machines manually. All the required data, from the tool length to the diameter, the service life and data specific to the tool type, such as the quadrants, goes directly from TDM to the production machine. To activate the data transfer, the machine operators only have to scan the data matrix code on the tool. They then place it in the assigned magazine location on the machine. According to Fankhauser, this optimized process "now prevents trans-

mission errors". BRUDERER is still in an extended test phase, which is designed to collect and analyze data to determine the change compared to manual data input on the machine. However, initial evaluations suggest that the interface guarantees significantly higher process reliability. "Since the data has been automatically transferred to the production machines, no processing errors or collisions have occurred due to incorrect tool data," underlines Müller.



TDM creates transparency and clarity in the working processes, and employees in particular benefit from TDM.



Since the data is automatically transferred to the production machines, there is no risk of machining errors or collisions occurring due to incorrect tool data.

Roger Müller, production manager at BRUDERER



Most importantly, the process is quicker and more user-friendly, and it was also possible to completely reduce the error rate that is inherent in manual data input.



It is also very important that during data input the machines at BRUDERER are no longer standing still. Before the introduction of the interface, it was not possible to manufacture using certain machine controls whilst manually transferring data. As the machine operators had to equip the machines with tools several times a day, the machine downtimes at BRUDERER were quite significant when added together. For Fankhauser, one thing is very clear: "The integration of our

production machines into the TDM solution has definitely been worthwhile." This is not just because it allows for more efficient production. It has also laid the foundation for the further digital development of how production is organized at BRUDERER. In addition, the solution relieves the machine operators of routine work that has to be done manually and, as Müller emphasizes, "last, but not least, makes our workstations on the shopfloor more attractive".

EVERYTHING AT A GLANCE

TDM networking with machine tools for greater automation and time savings

TDM in use at BRUDERER



Company

- 460 employees
- Founded in 1943
- Headquarter in Frasnacht, Switzerland



Sheet metal stamping and forming industry

- High-performance stamping machines
- BSTA series: with a nominal force of 180 to 2500 kN and a speed range of 1 to 2300 rpm.



TDM in use at BRUDERER

- TDM Base Module
- TDM CAM integration TopSolid7
- Simulation system Vericut
- TDM Shopfloor Manager Global Line
- TDM Tool Crib Module Global Line
- TDM Machine Connect Webservice and the ECI Box middleware

BRUDERER's objectives

- Fully secure processes on the shopfloor
- Avoiding manual data input on the machine
- Consistent data connection to the machine
- Realizing the machine's potential for optimization

Process innovation through machine integration

- Automated tool data transfer to the machine control activated by the data matrix code on the tool
- Bidirectional data connection to the machine
- Comprehensively transparent and efficient tool preparation taking account of:
 - tool conditions and machine stocks
 - tool requirements for each NC order and
 - continuously monitored tool lives via the traffic light system
- Continuous verification of the NC plan data by securing the data feedback from the machine

BENEFITS



Optimized processes

- Higher process reliability
- Securing the tool supply to the machine



Cost savings

- Optimal utilization of tool life and tool service life



Realization of zero fault tolerance

- No processing errors or collisions due to incorrect tool data in the machine



Minimized machine downtimes

- Optimal utilization of tool life and tool service life