User report

KEBA
Automation by innovation.

Ersa and KEBA AG: Fit for the future!

KEBA site Linz.

Highest quality and maximum flexibility thanks to the VERSAFLOW 4/55

The Austrian company KEBA AG was able to celebrate a milestone birthday in 2018 – the company was established in Linz 50 years ago. Since then it has been involved in the development and production of control and operation solutions for complex automation systems.

KEBA AG is an international company with subsidiaries around the world and currently employs 1,200 staff. Recently, a 4th generation selective soldering system was installed in the third largest city in the Alpine republic: an Ersa VERSAFLOW 4/55 with two VERSAFLEX soldering modules.

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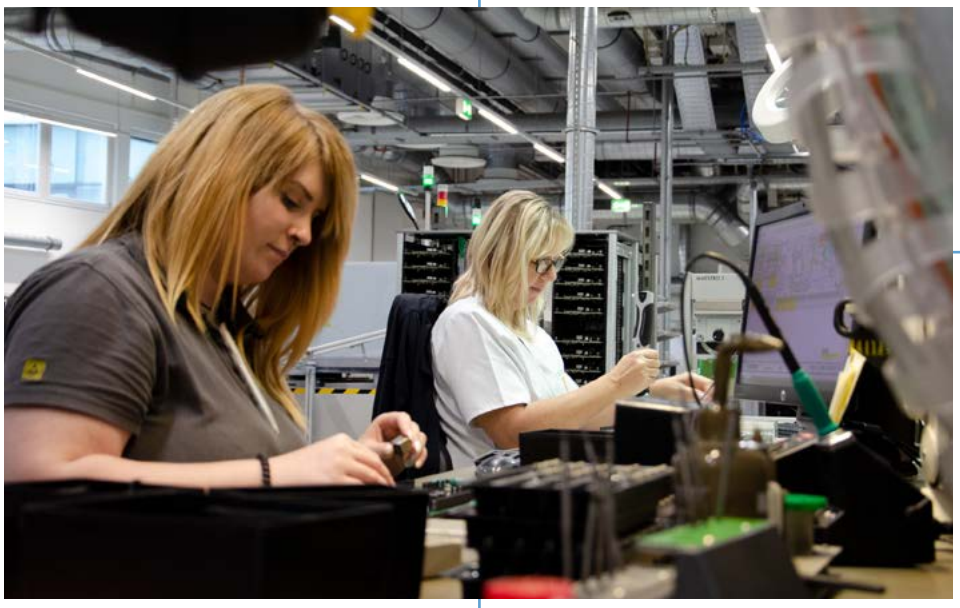

Staff in electronics manufacturing at KEBA.

Since its foundation in 1968, KEBA AG has pursued the aim of simplifying people's lives and working worlds with its products and solutions. Numerous awards and innovation prizes demonstrate that the company's claim "Automation by Innovation" is indeed followed. The product range is divided into four categories industrial automation, logistic automation, bank automation and energy automation. What do these stand for? For example, control for painting robots or injection moulding machines. Here, with its KeTop terminals, KEBA is global market leader for mobile terminals for teaching or programming robots or systems. KEBA is also the leader in the area of package automation – for example the "pack stations" used by DHL Deutschland come from the Linz-based company. Customers of a Raiffeisenbank or Commerzbank have probably withdrawn or lodged cash from or to a KEBA ATM at some time or other. The latest production sector is charging stations for electric mobility, where KEBA is among the top manufacturers with over 100,000 systems sold worldwide.

"The products developed by KEBA are not available on the internet. We concentrate on the development of specific solutions for specific customers. Close, long-standing partnerships are central to our work because years may pass before a control product can go into series production. The needs or wishes of our customers are our challenge," explains Erwin Schöfer, Plant Manager Electronics Manufacturing & Product Assembly at KEBA. For over 40 years, KEBA AG has also maintained a long-standing partnership-based relationship with the soldering system manufacturer Ersa from Wertheim. One milestone in the cooperation between the two companies was the changeover to lead-free technology. To this end, an N-WAVE 330 wave soldering system and a VERSAFLOW B selective soldering system were purchased from Ersa in 2005 and 2006 respectively. Both systems have been serving the customer reliably for over ten years now. "This reliability was what led KEBA to turn to Ersa once again for the current project. In addition, we place great value on service, delivery capacity and quality," explains Erwin Schöfer. "And in this regard, experience shows that we can confidently place our trust in Ersa."

URGENT ACTION REQUIRED: EXPANSION OF THE SELECTIVE LINE

KEBA has displayed constant growth since the establishment of the company – one parameter for growth in electronics manufacturing is the number of fitted components: Whereas the number of fitted components at KEBA lay between 140 and 150 million in 2014/15 and 2015/16, this figure will have risen to over 400 million by the conclusion of KEBA's business year in April 2019 – around three times the number! The machinery project for a new selective soldering system was considered as far back as 2015 and ultimately realised in 2017. The existing selective line with the VERSAFLOW B was being used to full capacity: By this stage, it was running in three-shift operation. The limit had been reached.

Facts

KEBA AG

- Establishment of company 1968
- Headquarters in Linz/Austria
- Sites Germany, Rumania, Turkey, Czech Republic, South Korea, Italy, USA, China, Japan, Taiwan, Netherlands
- 1,200 employees worldwide
- EUR 253.6 million turnover (31.03.2018)

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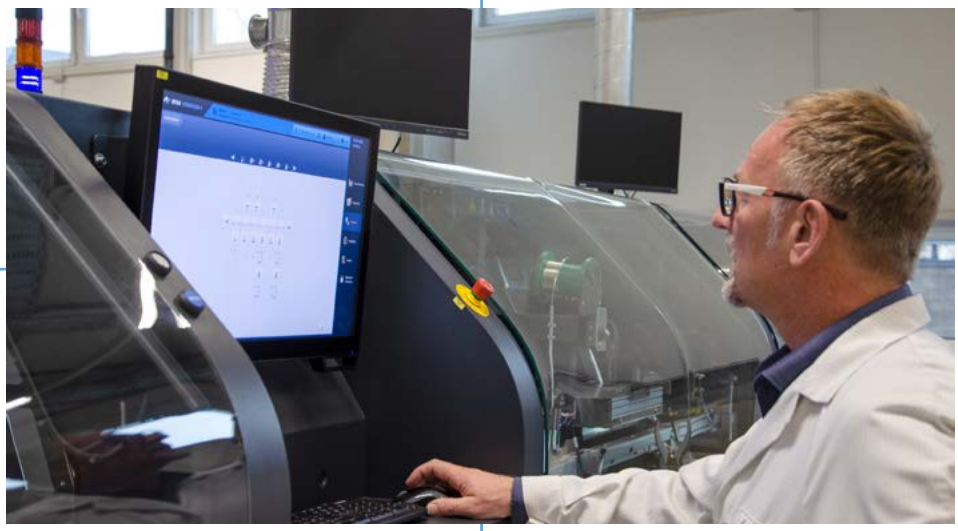


No compromises: In the ERSASOFT 5 machinery software, the ideal parameters can be set for each soldering point.

Any longer disruption would have represented a major risk for delivery reliability at KEBA. The expansion of the selective line was essential.

Two requirements were clear from the very beginning: high quality standards for the soldering result and a significant increase in throughput in order to provide a cushion in manufacturing capacity. Stipulation for the cycle time: 2–3 min. With these specifications and a selection of components, the colleagues set off from Linz to Wertheim to evaluate the machinery and carry out extensive sample soldering. Even in the soldering tests on the VERSAFLOW 4/55 it became evident that they were on the right track. Up to then, the cycle time for one product was 5 – 6 minutes. With the VERSAFLOW 4/55 featuring two VERSAFLEX soldering modules which has now been installed, these times have been halved to 2 – 3 minutes. This means that the new system is between two and three times as fast. "The specified cycle time was achieved very quickly in production. We are back working in single-shift mode and KEBA has the desired space for growth for the next few years," says a delighted Erwin Schöfer. The "old" VERSAFLOW B continues to produce spare parts and small series, while the 4/55 has taken over the series production.

VERSAFLEX: ASYNCHRONOUS MODE FOR OPTIMUM STATION TIMES

The same variety seen in the KEBA product spectrum is reflected in the components and PCB panels in electronics manufacturing. This of course results in different spacing of the PCB in use. In order to process these economically, a further stipulation made by KEBA was the automatic programme-controlled y-setting option for the axes in the double soldering module. In the course of the project, it became evident that it was not the standard double soldering module which achieved the best cycle times and flexibility but rather the individually-adjustable VERSAFLEX module. In this double soldering module, the two solder pots are not installed on one axis but rather on two independent axes. This gives KEBA completely new possibilities as regards the variability of the system – depending on the application, PCB panels can continue to be processed in parallel operation. For products which, for example, are processed using different nozzle diameters, the asynchronous mode is ideal. Here the two pots move on their axes completely independently and do their jobs at the same time which, of course, is positively reflected in the cycle time.

COMPETITIVE THANKS TO TOP PRODUCT QUALITY

The CAD Assistent 4 integrated into the machinery software of the VERSAFLOW 4/55 is used for creating the soldering programmes. The auto routing function ensures optimised cycle times thanks to efficient process paths. Definition of the exclusion areas prevents collisions. In addition, the software automatically distributes the soldering tasks to the two existing modules and contributes further to optimised cycle time. "With the VERSAFLEX modules, we were able to give KEBA exactly the flexibility and efficiency which the company needs in the new selective line,"

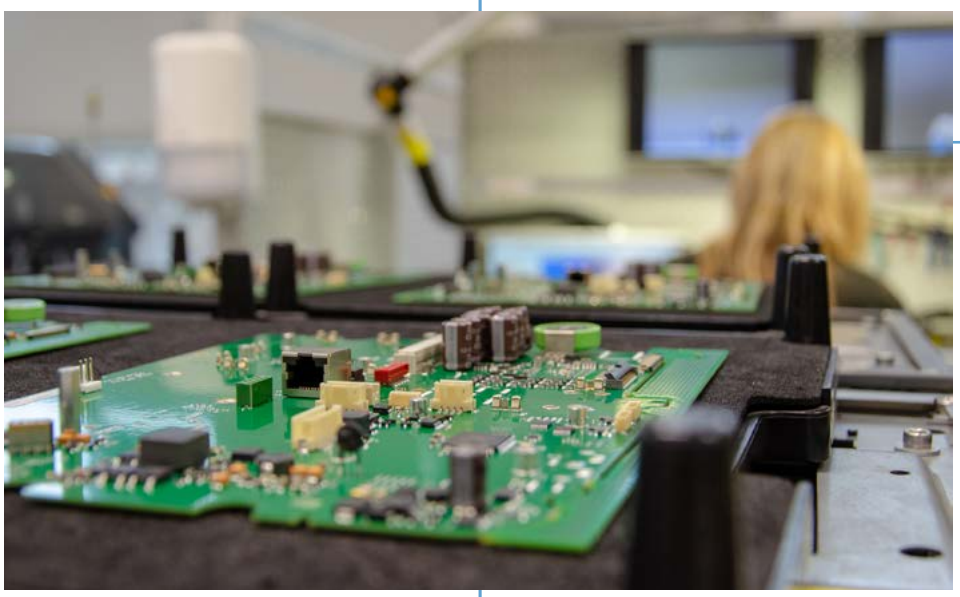
A smooth-running team: Ersa Sales Engineer Mark Birl and the staff responsible at KEBA standing in front of the new VERSAFLOW 4/55.

says Ersa Sales Manager Mark Birl. Nor does KEBA have to compromise in any way on soldering quality. Delivery was taken of the VERSAFLEX ULTRA software package which allows each soldering point to be assigned an individual set of parameters. "As a result, the customer does not have to work with average values, but can process each soldering point with the matching parameters," explains Mark Birl further.

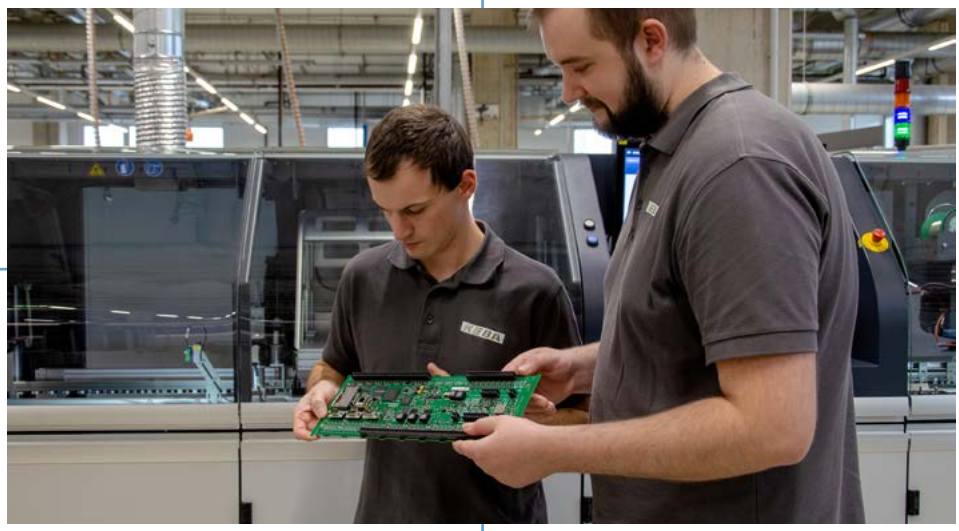
A European electronics manufacturer can only survive in international competition by supplying top product quality. When it comes to soldering, the soldering module alone is not decisive. The preliminary process too – such as pre-heating – plays a vital role. Homogenous and gentle pre-heating is important to avoid damaging the components. In order to guarantee reliable and good capillary fill, the right basic temperature of the PCB and component is necessary. In this way it is possible to avoid the liquid solder solidifying half way through the process, because the PCB or component draws off too much heat energy. The second risk is that the PCB or components suffer thermic shock as soon as it comes into contact with the solder. Excessive temperature differences can lead to mechanical tensions resulting in damage to the assembly.

MODULAR CONSTRUCTION TO ADAPT TO CUSTOMER REQUIREMENTS

The KEBA products are what are known as long lead time items – this means relatively long soldering times per product. This requires a good basic temperature for the assembly. "For this reason, we integrated an additional pre-heating module in front of soldering module 01, and a additional pre-heating module between soldering module 01 and 02 to retain the temperature of the assembly," explains Mark Birl. Adaptations of this kind to meet specific customer requirements can be easily catered to thanks to the modular construction of the VERSAFLOW 4/55.



The course is set: The production was doubled with the new system.



Experts at work – the KEBA process technicians.

All pre-heating modules are equipped with IR lower heaters and upper convection heaters, guaranteeing efficient, reliable and homogenous warming. In addition, to further support the soldering process, heating was integrated into the nitrogen fumigation. The warm nitrogen exits the fumigation ring, surrounds the soldering nozzle and flows directly to the stele to be soldered. The soldering point is additionally heated to prevent premature hardening in the feedthrough. An advantage with slender pins, standing far apart, where the energy does not wander from soldering point to soldering point. In the medium term, the VERSAFLOW will be working at full capacity in two-shift operation, because, at KEBA, all the signs indicate further growth. With the VERSAFLOW 4/55, the selective soldering area is ready to cope. And should a third soldering module become necessary, which KEBA anticipates – no problem either. Because the lines for energy and data transfer to the third soldering module have already been integrated into the machine. If expansion is required, a call to system partner Ersa is all it takes, and the system is upgraded and ready to go again in two days. ■

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Erwin Schöfer, Plant Manager Electronics Manufacturing & Product Assembly at KEBA, with a hand terminal for teaching robots.

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