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FASTER AND MORE FLEXIBLE: SUCCESSFUL MODERNIZATION OF THE THT PRODUCTION

EMS PROVIDER BAUDISCH ELECTRONIC INCREASES PRODUCTIVITY AND QUALITY WITH COMPLETE SOLUTIONS FROM SEHO

BY HEIKE SCHLESSMAN, MARKETING MANAGER, SEHO SYSTEMS GMBH

30 years ago, the first electronic assembly from Baudisch Electronic GmbH left the factory in Germany. Since then, the EMS provider has grown continuously and has also continued to develop technologically with modern production equipment. The focus on the customer and the passion for the product remained a constant.

Baudisch Electronic is one of the leading EMS full-service providers with its own EMC laboratory and manufactures prototypes as well as small and large series.

The industries for which the company develops and manufactures electronic systems are as diverse as Baudisch Electronic is: from industrial technology, robotics and building automation to sensors, measurement and security technology, to communication systems, wireless applications and medical diagnostic systems. Right from the start, Baudisch Electronic relies on top performance in electronics development to ensure the market success of customer products. The highest quality and safety standards, the economic feasibility of all process steps and adherence to delivery dates have top priority.

On request, Baudisch Electronic will take over the entire process of creating customer products. The core competencies include the development, manufacture, testing, assembly, and packaging of electronic devices ready for the end user. Customers are free to choose whether they access the entire range of services or require support in individual project stages. Irrespective of the scope of services, they always benefit from excellent service, not least thanks to a consistent, personal contact person who takes care of everything. From the idea to the market launch to series production, the shortest possible times are guaranteed.

Open to any task: The precise fluxer, the individually configurable preheating area and a state-of-the-art soldering area are just a few of the advantages of the SEHO PowerWave N2 nitrogen wave soldering system. source: SEHO Systems GmbH

Due to continuous growth, Baudisch Electronic reached its capacity limits in the THT production area in 2020. The existing selective soldering system was working at full capacity, and it was initially considered whether it should be replaced by a larger system, whether an additional selective soldering system should be procured or whether an additional wave soldering system should be invested in. "In order to continue to offer our customers a high level of flexibility and short throughput times, it was clear that we had to expand our production facilities," explains Matthias Lenz, Managing Director of Baudisch Electronic, and he adds: "On the one hand, production should become even more efficient through a higher degree of automation. In addition, a new THT production line should give us the opportunity to produce higher quantities, but at the same time we wanted to be able to react quickly to different order volumes and assembly layouts." After a precise analysis of the existing product portfolio, it became clear that a wave soldering system provides the greatest benefit.

"We are a full-service provider ourselves and therefore know the advantages of having everything from a single source," says Matthias Lenz. "With SEHO Systems GmbH we have found the right partner for our project: A high-end wave soldering system, assembly workplaces and fully automated workpiece carrier handling – everything from a single source, plus competent advice, a permanent contact person and a good price-performance ratio."

The specification for the new THT production line not only included the capacity expansion and a higher degree of automation. Above all,

To be successful as an EMS provider, not only error-free production is necessary, but also a high degree of flexibility in the production processes. source: Baudisch Electronic GmbH

the new production system had to offer a high degree of flexibility. Not only should the existing product portfolio be transferred to the new line, but Baudisch Electronic also wanted to be perfectly positioned for future production tasks.

Another important criterion was the assembly workplaces integrated in the automatic line. Employees should feel comfortable in their workplace. One of the basic requirements was therefore the ergonomic design of assembly places with storage areas and uncomplicated gripping paths, as well as the possibility of being able to adjust the height of each place easily and flexibly to the respective operator.

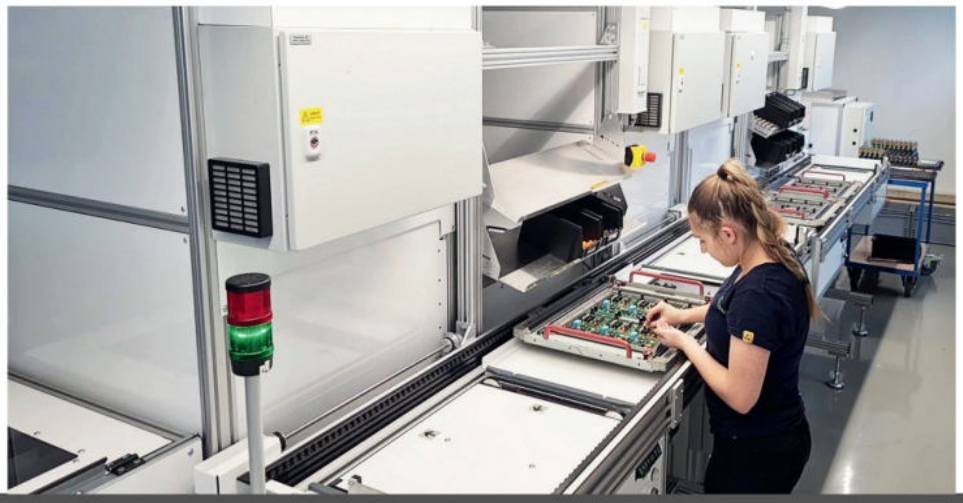
"A critical point in the design of the new production line was the space available," says Matthias Lenz. "All requirements for both the performance of the soldering system and the handling system had to be accommodated in the space available in the existing production hall."

In close coordination with Baudisch Electronic, SEHO developed a production concept that perfectly covers all points from the specification: flexible both in terms of layout and the number of customer products to be manufactured, high quality, automated with complete traceability of the process steps and yet compact.

The heart of the production line is the SEHO PowerWave N2 nitrogen wave soldering system, which was specially developed for the production of medium and large series and is primarily designed to optimize product quality. Thanks to the worldwide leading nitrogen technology developed by SEHO, the system also impresses with low consumption values and energy-efficient closed tunnel system against the background of resource-saving use of raw materials.

In the fluxer area, the PowerWave N2 is equipped with a spray fluxer with HVLP technology (high volume – low pressure). “Exact flux application, both in terms of the

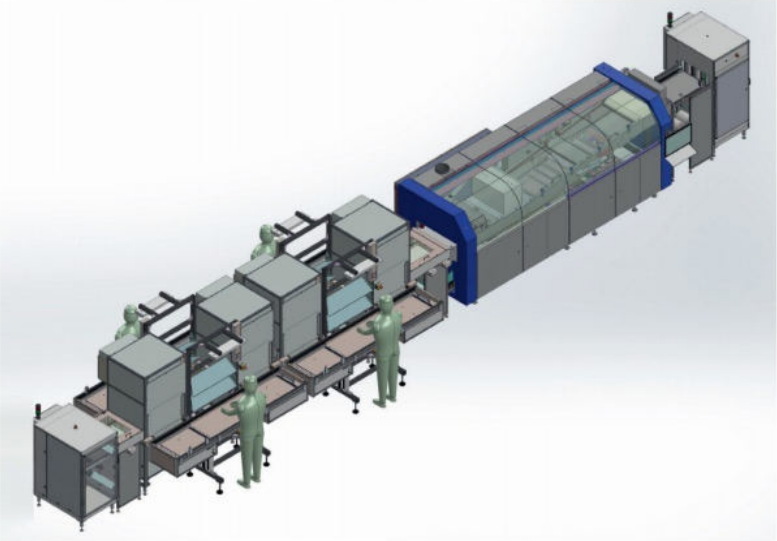
Ergonomic, individually height-adjustable assembly workplaces and automatic height adjustment stations are part of the overall concept of the new THT production line at Baudisch Electronic. source: Baudisch Electronic GmbH



amount of flux and the spray pattern, is crucial in the wave soldering process. Too much or too little flux can cause soldering defects, and unwanted flux residues can gradually lead to a reduction in the function or service life of an electronic assembly," explains Maik Doerr, process engineer and responsible for wave soldering at SEHO. On the one hand, the HVLP spray head ensures a stable spray jet, on the other hand, a very precise spray pattern is achieved, even in the edge areas - without overspray or residues on the circuit board after soldering.

The pre-heating area of the PowerWave N2 can be individually configured over a length of 1800 mm and thus adapted to any production requirement. The system at Baudisch Electronic is equipped with a convection module in the first preheating zone, which works particularly effectively and is gentle on the components. Convection in the preheating process ensures that the entire assembly is heated very evenly and is also ideal for processing water-based fluxes. Therefore, the EMS provider is also excellently positioned to produce thermally very demanding assemblies.

The space-saving, modern THT production line from SEHO ensures more flexibility and shorter throughput times at Baudisch Electronic source: SEHO Systems GmbH



The soldering area of the system is designed so flexibly that it can be used for any task. Two up-to-date soldering nozzle geometries, the automatic program-related height adjustment of the nozzles, the stable nitrogen atmosphere, and the programmable sectorial soldering function with individual parameters on up to 16 areas within an assembly, ensure optimum soldering results and maximum flexibility.

Of course, all process steps are automatically monitored.

The biggest challenge of the overall line was the limited space. A length of only 14 meters was available and the line should have at least two assembly workplaces.

With the creative handling concept of the SEHO automation team, it was even possible to integrate four workplaces that can be individually adjusted in height independently of each other.

Two assembly workplaces opposite each other and a central conveyor system to the soldering machine ensure minimum space requirements.

Once a printed circuit board has been assembled, the operator pushes the workpiece carrier to the right and releases it for the soldering process with a button. An automatic height adjustment station picks up the workpiece carrier independently as soon as a position in the central conveyor system to the soldering machine is free. After the soldering process, the workpiece carrier is returned below the soldering system in a cooling tunnel, which cools the assembly down to around 40 degrees Celsius, depending on its mass. In a lift station, the workpiece carrier is lifted back to the assembly transport level and adjusted to the respective workplace height in another height adjustment station, before it is automatically passed out to the workplace.

Different PCBs can be assembled at the four workplaces or, in case of large production series, the same products.

The workpiece carriers are automatically routed within the production line via RFID technology, including the automatic changeover of the soldering program if the workplaces are used for the assembly of different products.

"Of course, there were still a few hurdles that we had to overcome when converting our processes to the new line," reports Matthias Lenz. During the installation of the new manufacturing line, production on the existing system could not be interrupted because customer orders had to be processed on time. The component placement processes had to be adjusted and employees received intensive training. The soldering process itself was also changed depending on the product, with previously selectively soldered assemblies being transferred to the new wave soldering system with specially designed soldering masks.

In the meantime, Baudisch Electronic produces everything from top-selling products to small batches in 2-shift operation on the THT manufacturing line.

The capacity and efficiency in the THT production area has increased significantly, which can be directly measured in the previously manufactured products that have been moved to the new line, and the employees are happy about the improved workplace conditions.

"All processes are much more efficiently, which is primarily due to the higher degree of automation. Our customers also benefit directly from this, as production quantities can be increased at short notice and the overall throughput time in the THT process has been reduced," says Matthias Lenz, summing up the project successfully implemented with SEHO.

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