

Ersa, Wertheim & Heidelberger Druckmaschinen, Wiesloch

Long life cycles of printing systems call for board rework

Precise and reproducible soldering

As a technological enterprise and partner of the print media industry, the Heidelberger Druckmaschinen AG (Heidelberg) is the internationally leading provider of solutions and services to the commercial and packing printing industry. As does everyone else in the branch, the company has its fights with the shrinking demand of promotional material and magazines. It is for this reason that Heidelberg puts its emphasis more and more on new business areas such as the manufacture of electronic products.

World-wide, this manufacturer of printing systems employs more than 15,400 employees, of which around 10,300 work in German plants. The largest German location is found in Wiesloch-Walldorf. The corporation offers all-encompassing solutions in the areas of pre-press, sheet-fed offset print, digital print and post-processing (binding, cutting and folding) , as well as in the manufacture of demanding components and assemblies for high precision systems. Its own, highly efficient electronic production facility is found in Wiesloch, where it had started in 1977, and where today, with about 320 employees, boards assemblies, modules and electronic cabinets are fabricated in the most diverse placement-, connection- and assembly technologies. The variety of products includes the control electronics for the direct implementation of graphical data on printing plates, and drive- and control technology, starting from the central main drive of the printing system up to servo- and small drives.

Heidelberg is the partner for demanding, high quality electronics for the internal use as well as for external customers. Heidelberg offers the complete product spectrum, from development incl. qualification, design, production and assembly.

To always be able to guarantee the use of the most modern and up-to-date production equipment, internal evaluations are performed on a regular basis.

Increased demands

The following is Heidelberg's philosophy: To keep the amount of rework required to the absolute minimum by focusing on stable production processes. Nevertheless, to have a flexible rework system within the plant is definitely required, if only because of the long life cycles of the printing systems. When, during the summer of 2011, the rework system in operation at that time did not conform any longer to the increased demands of its electronic production, Heidelberg started to look around for a new system. Requirements called for a flexible system with a precise, reproducible process for varied applications. "Especially during the product development process and in the different repair cycles, it is frequently essential to resort to a rework system", states Klaus Riedl, Electronic Prototyping and Technology in the Wiesloch-Walldorf factory.

But not only that: Should there ever be a problem in the series production, an outstanding rework system can be of immense help. If the issue is repair, Claus Riedl can very well appreciate the benefit of an innovative rework unit: "Because of the longevity of our products, we have to be in the position today to repair assemblies that were manufactured in the '80th, so that we are in the position to return products, as certified original spare parts, to the market. The warranty period is 15 years after the discontinuation of the system, with a possible life expectancy of the system of 30 years. The demands on an assembly more than 10 years old are less than the demands on the highly complex assemblies of today.

Frequently though, the equipment on which the assembly had originally been build is no longer available, which makes a suitable rework system in the plant almost indispensable. Most of the time, the repair of the often very expensive electronic part is more cost effective than having it scrapped. Sophisticated ware housing of discontinued electronic components ensures that the required spares for the repair are in-house available.

After reviewing the demands placed on a new rework system, it soon became apparent that a unit was required that not only flexibly could process our various assemblies, but that also was easy and simple to operate. After going through a period of evaluation, Heidelberg decided to stay with the supplier of its presently installed system, and it invested in the flag ship of Ersa, the rework system IR/PL 650.

High standard of quality

Heidelberg's demands on the rework system were, because of the very broad spectrum of demands placed on it, very complex, yet they had to be fulfilled. "The challenges placed on the repair unit are the different materials and technologies used by us. Since the introduction of electronic controls, we have to process and handle different PCB materials as well as numerous exotic components in all sizes and shapes. For these reasons, the demands we placed on the repair unit were very high", states Claus Riedl.

Reproducible soldering results or quickly and easily finding the right profile were just as important a criteria as was a high flexibility of the system. In addition to the visualization of the de-soldering and soldering process, these processes also had to be absolutely safe and demonstrate an even temperature distribution when operated in a semi-automatic mode. Being able to handle to high density of components on our boards was another of the evaluation criteria. Even when in close proximity of through-hole components, high quality SMD repairs should be possible.

Not only the good, longstanding cooperation between both companies, but also the price-performance ratio and the impressive features offered by the IR/PL 650, which covered all the demands of Heidelberg, lead us finally to select the rework system from Ersa for our manufacturing site in Wiesloch. It will join there the other Ersa equipment installed in our electronic production facility, 2 Ersa Selective Soldering Systems and a number of different hand soldering tools. After issuing the order for the rework system, the unit was shortly thereafter ready for operation in production. Ralf Walk from Ersa reports: "While the tasks placed on the unit by Heidelberg were challenging, they were not new to us. Combining our knowledge of the process with our longstanding experience in rework technology it became clear pretty soon that a fully configured IR/PL 650 was the ideal system for Heidelberg. Our broad range of systems with its different configuration levels allowed us to supply a system that responded exactly to all the demands, without requiring any compromises. And, as requested, we could very quickly ship a unit to Heidelberg for a 14-day evaluation period".

Flexible Rework

The rework system IR/PL650, with its 4.400W heating capacity, is laid out for large and complex printed circuit boards. Its dynamic IR-heating technology, 9 programmable upper and lower heating zones and the precise, user-friendly and motor-driven Auto Pick&Place represent but a few of the strong features available. With only a few interventions by an operator, a stable and repeatable rework process can be initiated for all applications. The dynamic IR heating technology ensures a fully automatic and dynamic control of the upper and the lower IR-emitters, so that the necessary heat is available at the right place and at the right time, saving resources while also limiting the stress exerted on the board assembly. The very small temperature gradients experienced by the components reduces board warp and brings with it a high process safety. With the RPC-Reflow-Process camera module, the process can be viewed under different angles and with high magnification, so that even the smallest components can be safely monitored during rework. The precision placing module PL 650 of the 2nd generation offers, aside from being able to handle a large range of different components, a high degree of automation while maintaining a level of repeatability of 100%. A modern, fully automatic and pressure controlled placement head places the component with a force of 1,5N, without ever losing the orientation of the components leads. A high-contrast, separately controlled, two-colored LED illumination from 4 sides ensures a high quality of the image viewed. The software module IRSoft controls the reflow modules during the generation of profiles and temperature recording. The new software update offers a clearly structured user administration, where a special login ensures that only those functions are made available for which the operator is authorized for. The individual operating modes are displayed in real time. For documentation and traceability, all process steps are automatically recorded. Universal software allows for easy and quick operation without any need for extensive training.

The rework system for Heidelberg was in production only a few days after a decision had been made: "Within a few days after our decision, Ersa was able to supply us with a unit for a 14 day evaluation. During this time we were able to get to know and to test the system, always supported by Ersa technicians. Aside from the usual excellent cooperation, the rework system quickly confirmed the result of our earlier findings. We optimized the process, kept the system

in operation in our production department, and are very satisfied with its performance”, states Claus Riedl.

With the investment in the new rework system, the longstanding and well-functioning partnership between the two companies continues.

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Board assembly and board rework are found in hall 9, which has a total of 11.000 m², of the Wiesloch-Walldorf plant.

Rework work place with the IR/PL 650 from Ersa

IRSoft ensures, aside from easy operation, no charge software updates

Control cabinets for printing systems monitor and control directly at the system, and they are part of the product range of Heidelberg.

Ersa Selective Soldering system in the electronic production area